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ILLUSTRATIONS.

New Buildings, Brasenose College, Oxford.—Mr. T. G. Jackson, Architect 834-835
View of Dining-room, and of Drawing-room and Library, of the Royal Mail Steamer *Ormuz*.—Designed by Mr. J. J. Stevenson, F.R.I.B.A. ... 838, 839
Church of St. James, Spanish-place, Revised Design.—Messrs. Goldie, Child, & Goldie, Architects 842-843
House at Grimsby.—Mr. Charles Bell, Architect 846
Summer-House and Smoking-Room, Bolton Royd.—Messrs. H. & E. Marten, Architects 847

CONTENTS.

Arterial Drainage in Ireland 813
"Antike Denkmäler": German Archæological Institute 834
Notes 835
Architecture at the Royal Academy.—VI. 837
Letter from Paris 838
Notes at the American Exhibition, Earl's-court 839
Obituary 839
The Decorative Work of Virgilius Solis 839
Machinery at the Manchester Exhibition 841
Brasenose College, Oxford 842
The Saloons of the *Ormuz* 849
R.C. Church, Spanish-place 849
A House at Grimsby 849
Summer-house and Smoking-room, Bolton Royd 849
Notes from Denmark and Sweden 849
The Late Sir Horace Jones 849
Builders' Benevolent Institution: Election of Pensioners 850
Competitions 850
Architectural Association Visit 850
Water Supply 850
Arbitration Case: The Great Northern Railway Company v. Her Majesty's Postmaster-General 851
The Imperial Institute 851
"A Student's Notes on Gloucestershire" 851
Provincial News 851
The Student's Column: Field Work and Instruments.—XXIII. 852
Dissenting Church-Building News 853
Recent Patents 855
Books: Collings's Circular Work in Carpentry and Joinery (Crosby Lockwood); Gatty's St. Wandrille's Abbey (G. Bell); Baedeker's Mittel-Italien und Rom. Achte verbesserte Auflage; Woodward's Geology of England and Wales (Philip & Son); Newsholme's School Hygiene (Swan); Holmes's Practical Electric Lighting (Spon); Holloway's Levelling and its General Application (Spon); Robert's Elementary Plane Co-ordinate Geometry as applied to the Straight Line (White) 854
Restoration of a Roman Aqueduct 855
Recent Sales of Property 855
Meetings 856
Miscellanea 856
Prices Current of Building Materials 857

Arterial Drainage in Ireland.

WHEN the Chancellor of the Exchequer explained his Budget, he said he proposed to give a grant of 50,000*l.* this year towards the development of arterial drainage in Ireland, in accordance with the recommendation of the Royal Commission on that subject. This Commission has just issued its first Report. It was appointed in October, 1886, to inquire into the measures required for the completion and maintenance of the system of arterial drainage in Ireland, especially in the districts of the Shannon, the Barrow, and the Bann, having at the same time regard to the improvement or preservation of the present means of inland navigation; and also whether, in order to carry out any works which might be recommended, it would be necessary that the amounts which could be charged upon the localities in return for the advantages derived from them should be supplemented by the Imperial Exchequer. The objects of the Commission included an inquiry into railway and tramway extension and deep-sea fisheries, but their first Report deals only with those things we have named. The Commission consists of Sir James Joseph Allport, Mr. James Abernethy, Mr. John Wolfe Barry, and Mr. Joseph Todhunter Pim. They examined fifty-three witnesses, some on the general question of drainage, others on the results of their experience of the subject in different points of view. They inspected the most important parts of these rivers, and visited works in progress elsewhere, and altogether made themselves acquainted, as they say, with the special circumstances of the country. The physiographical features of Ireland are peculiar. The great central plain is surrounded by high ground near the coast; the climate is humid; there are few outlets through which rivers can escape to the sea. These salient features are of themselves sufficient to suggest at once the need for artificial drainage, and the probability of difficulties in carrying it out. The inclination of the beds of the rivers, especially those of the larger rivers, are sufficiently steep near their outfalls, but they are exceptionally flat along the middle portions, whilst the upper parts of the rivers are often steep. Thus, with the considerable rainfall of Ireland, large quantities of water find their way rapidly to the middle parts of a catchment basin, but cannot find an easy exit, owing to want of fall in that part of the river course. With regard to floods, in the case of low-lying meadow lands, the winter floods are not so injurious as the summer and autumn floods, but very competent judges hold that complete relief from these should be attained if arterial drainage is to be really successful.

There are, we dare say, people who would think it a far-fetched idea that drainage could influence climate in any place, but the Commissioners gave some attention to this, and say that both general considerations and the evidence of experts go to show that large tracts of wet land tend to lower the summer temperature of the districts in which they are situated and to diminish the amount of sunshine. Both these results cannot fail to be injurious to agriculture in Ireland, where, owing to its geographical position, the summer temperature is relatively low and the sky is frequently clouded. The strongest proof of the effect of damp land on temperature is that the July temperature of the middle of Ireland is lower than that of either the northern or the southern part, and the greatest amount of wet land lies in the middle part of the country. These climatic conditions, while distinctly affecting the ripening of the crops, cannot fail, in the opinion of the Commissioners, to have effects prejudicial to health, though it would be hard to prove this statistically.* The direct effects of the drainage of lands on adjacent towns, as regards both general improvement of sanitary conditions and improved outfalls for sewage, are more tangible, and are very considerable.

The present condition of arterial drainage in Ireland has led the Commissioners to the conclusion that what the Committee of the House of Lords which sat in 1877 said about the condition of the rivers of England applies with at least equal force to Ireland. It was that "the constitution of a drainage Board in any district is not compulsory, so that in many cases districts urgently in need of such bodies are without them. The principle of rating exclusively according to the benefit accrued is difficult of application, and is frequently found to work unsatisfactorily in practice. Owing to the existence of several distinct authorities for the course of a single river, conflicts have arisen which are fatal to the adoption of any uniform and comprehensive scheme for the conservancy of the river as a whole, and there is, moreover, an absence of responsibility which may be held to account, in a great measure, for the present neglected state of several important streams." Confusion of authority in the proper drainage of the country reigns in Ireland as completely as it does in England. There is no system in Ireland for the conservancy of rivers, nor any department of Government charged with the subject; and in many cases, where the proper regulation of a river is matter of public concern, it is under the control of no one, and is often obstructed and neglected. Drainage districts are formed without any regard to the interests of the larger river basins in which they lie, and so arranged as to escape their share of what should be a common responsibility. On the other hand, the boundaries of such districts are so arranged as to impose on their promoters responsibilities which ought to be shared by others, and to force these promoters to confer benefits on their neighbours towards the cost of which they contribute nothing. Instances occur in which some physical obstruction which is, in an engineering sense, the key to the position, is left outside the boundary of a district, the Board of which has no power to deal with it; and others, in which a district has been forced to execute expensive works below its own limits, actually conferring a benefit upon its neighbours without any power of imposing a corresponding charge. Some rivers, with no marked difference in their course, are in the charge of two Boards, each of which is naturally disposed to look with suspicion on any action taken by the other; while other rivers have been dealt with in short sections, separated by unimproved reaches. The drainage of a whole district may be stopped by a mill which cannot be bought out except on prohibitive terms, and which, perhaps, is not doing any appreciable amount of work, the vested interests in it being based on encroachments which a proper system of conservancy would have prevented; or, again, the lower section of a river may be overwhelmed by the water sent down it from the upper areas, which, being exempt from taxation, pay nothing towards the damage so caused. The first step to be taken for the improvement of the existing state of things is the adoption of the proposal made for England that the catchment area of every main river should be put in the charge of a separate body of conservators, representative of the various interests concerned, who should be responsible for the maintenance and improvement of the *main watercourses*, with the necessary powers for executing works and obtaining funds.

These bodies would be Conservancy Boards. The area of jurisdiction of each such Board should comprise the whole catchment area of a river, down at least to the limit of tidal water. In the case of the Shannon, however, a district formed on these principles would be for several reasons undesirable, and in this case the principal tributaries down to the point of junction with the main river should each form a separate district, and Government should

* We drew attention to this subject in the *Builder* of July 10, 1886.

continue to maintain the Shannon itself. The number of Conservancy Boards for the whole of Ireland would probably not exceed thirty, omitting the smaller basins. It would, the Commissioners say, be proper that Government should take steps to form these main districts without being set in motion by local initiation, and preliminary surveys for this purpose might be begun in the present year, without waiting for the legislation which would be required to bring the recommendations of the Commissioners into effect. In rating the different parts of each catchment basin of a river distinction should be made between lowlands, midlands, and uplands. A limit should be put upon the rate to be levied on the uplands, say one-tenth of that charged on the lowlands, and upon these it may be expedient to fix a maximum rate which may be levied, so as to guard against indefinite taxation. But besides such works as would fall within the province of the Conservancy Board, there are many cases where local works are required in order to free from floods particular tracts of land or to regulate tributary streams. The responsibility for the construction of such works, as well as the resulting pecuniary liability, should remain with those locally interested, subject, firstly, to Government advice, and, secondly, to the condition that one district should not injure others for its own benefit. Some tributary streams form naturally separate districts, and can advantageously be dealt with apart from the main river, and there are smaller rivers which do not lie in the larger basins and would not require a Conservancy Board, while yet they may require arterial drainage. For each area of these minor districts a District Drainage Board should be formed, its jurisdiction being confined to the lands directly benefited by drainage, and its duration limited to the period of construction, the duty of subsequent maintenance falling upon the Conservancy Board along with that of the main watercourses. This being the working organisation by which improvements of the arterial drainage would be carried out, a cognisance of the whole would be placed under a Government Drainage Department, which would take the place, for this purpose, of the present Board of Works, which would be relieved of so much of its multifarious duties as relates to arterial drainage. Such a department would be mainly an engineering one, but, in addition, the financial interests of the Government must be adequately represented. With respect to finances, drainage loans are at present repaid by a fixed annuity to cover interest and sinking fund, either of 6*l.* 10*s.* for twenty-two years or of 5*l.* for thirty-five years, for every 100*l.* advanced, the rate of interest being taken at 3½ per cent. Having regard to the rate at which Government can now borrow money, and in view of the greater control of expenditure recommended by the Commissioners, they consider that the rate of interest may properly be taken at 3¼ per cent., and that the maximum term for the loan may be extended to forty years.

There is no definition of arterial drainage in the Irish legislation on the subject, but in the Land Improvement and Arterial Drainage Bill introduced by Government in 1885 this omission is supplied, and is as follows :—

> "Cleansing, repairing, and otherwise placing and maintaining in a due state of efficiency any watercourse or outfall for water, or any wall, bank, dam, or other defence against water.
>
> Deepening, widening, straightening, and otherwise improving any watercourse or outfall for water, and removing any milldam or other dam, weir, or other obstruction to any watercourse or outfall for water, and raising, widening, and otherwise altering any of these.
>
> Making any new watercourse or outfall for water, and erecting any new bank, dam, &c."

With regard to the recommendations of the Commission, we should be inclined to agree in all that relates to drainage, but a very unsatisfactory part of the Report is that which relates to the inland navigation of the country. We look at the constitution of the Commission and find in Sir James Allport a representative of the railway interest ; in Mr. Abernethy a dock and harbour engineer, but one who has declared that he is "not a canal engineer" ; in Mr. Barry an engineer who, however eminent and admirable as his general practice is, would not occur to us as the most eminent in navigation works ; so that if there is a member of the Commission who is inclined to look favourably upon inland navigation as a means of improvement along with arterial drainage, and to devise such works as would make these two requirements compatible, it must be Mr. Pim. The instruction to the Commission was to report "What measures are required, with due regard to the improvement or preservation of any necessary facilities for inland navigation, for the completion and maintenance of the system of arterial drainage, and whether increased facilities could be afforded to trade and commerce by any changes, legislative or otherwise, in the organisation and management of the Irish railway system, or by an extension of the Acts for aiding the construction of tramways or other cheap means of communication with existing lines"; and with the view to the extension of railways, the members of the Commission seem to have been well chosen. For the questions of fisheries and harbours Mr. Abernethy probably was specially chosen, but with regard to inland navigation, equally to be inquired into with fisheries, railways, and drainage, we should say that the Report of the Commissioners is inadequate. They were to inquire into the circumstances of three navigable rivers. In one, the Barrow, they recommend twelve out of forty-three miles to be improved for navigation ; in another, the Shannon, they recommend the depth of water to be reduced 2 ft. ; in the other, the Bann, that the navigation be abandoned altogether.

These attempts at destruction rather than improvement are based upon the fact that the income from inland navigation in Ireland has hitherto been small ; but this, surely, is a very insufficient reason. The object is a general improvement in the prosperity of the country, as far as that can be obtained by engineering works, of whatever kind, within the means at command of the Government, and the way in which this can be done is to provide such means as may in the future contribute to that end, and not merely to strike a debtor and creditor balance of what has been, and so limit the possibilities of future improvement. It is this system of government which has earned for England the not altogether undeserved renown of being incapable of governing Ireland. A country which, according to the Commissioners' own showing, is so flat for such great distances, and which has an abundance of rainfall, is one where inland navigation is easy and inexpensive, and where it needs only excavation of the ground to produce waterways sufficient for all purposes of commerce, and which same waterways will, if cut, drain the low-lying land near and far.

The weak part of the Report of the Commission is as follows :—"Another most troublesome physical characteristic [the others being those we have named, viz., humidity of climate, few outlets of the rivers to the sea, inclinations of beds of rivers exceptionally slight along the middle portions] of Irish rivers, large and small, is that there are many obstructions in their beds, and that these are frequently of rock of the hardest character. Even where not rocky, the beds of many rivers consist of very hard gravel, almost a conglomerate, or of tenacious boulder clay. These conditions suggest the embankment of rivers rather than excavation, as the most economical method of confining the rivers within proper bounds and of protecting lands from floods." "One reason why embanking has not been adopted has been an apprehended difficulty in some localities of effectually draining the flat lands behind embankments ; but another more cogent reason has no doubt been the desire, in several important instances, to associate navigation with drainage, which, with an embanked river, would involve a permanent raising of the water level" (of the navigation). But the cropping up here and there of hard rock in the course of a waterway, or the presence of tenacious boulder clay or of very hard gravel, are difficulties which could be easily surmounted were there the will, and when done the channel would drain the land and be a waterway for all purposes ; and when the land is drained, and a way made for the removal of its produce, the population might earn their bread at home.

The flatness of the great central plain of Ireland is a feature favourable to the point in question. The more level a country the fewer the locks required on any given length of navigation, and the fewness of the locks is a great set-off against the greater expense of excavating hard ground, and fully compensates for the greater expense of an excavated channel over that of an embanked one. The embanked channel would be cheaper, but it would perpetuate a mistake in engineering.

"ANTIKE DENKMAELER": GERMAN ARCHÆOLOGICAL INSTITUTE.

THE appearance of the new *Denkmäler** has been eagerly looked for by archæologists. Of all the new series of publications by the German Institute, it is issued last, and is in many respects the most important. It takes, it will be remembered, the place of the old *Monumenti*, which, after running an honourable course since 1829, has now ceased to exist. It takes the place of the *Monumenti*, but with a marked difference, or rather, to be accurate, two marked differences, which it may be well to note at the outset. First, the *Monumenti* was issued at Rome ; the *Denkmäler* appears at Berlin. The *Monumenti* necessarily, though it did not close its doors to other countries, was chiefly concerned with the antiquities of Italy,—there was a natural bias in favour of art found on Italian soil. This resulted in a preponderance of Græco-Roman statues, Pompeian wall paintings, Italian terracottas, vases, and the like. Now the centre of gravity shifts to Berlin. As the antiquities of the Museum come from all parts of the ancient world, we shall hope for a future equilibrium. Dr. Fränkel, the editor, is just the man to rightly hold the scales.

The second point of difference between the old and new *régime* is, to our minds, an even more marked advance. The old *Monumenti*, it will be remembered, was a series of folio plates, accompanied by the issue of the *Annali*, an octavo volume uniformly made up of dissertations on the *Monumenti*. In no case was a monument published without this corresponding explanatory treatise. With the *Denkmäler* we have quite a new departure. The plates appear, and with them the briefest possible description, which confines itself strictly to noting matters of fact, *e.g.*, place of discovery, explanation of plate, restorations, &c. ; in fact, just what we should expect from a good catalogue. This at first sight may seem loss, not gain. It is, in fact, an innovation of the highest utility. Any one who knows the ins and outs of archæological investigation, especially any one connected with a museum, knows how the science is kept back by delay in the publication of monuments. One reason of this delay is, of course, lack of funds, but an even more important practical reason is that a false tradition has sprung up as to the right moment for publication. A monument, be it statue, vase, or gem, is published now, be it in the *Hellenic Journal* or any foreign periodical, because some one has come to understand it, has a theory about it, and wants to utter his theory,—the monument waits for the man. The right method is quite otherwise. Publish the monument in order that it may be understood. Give it to the archæological world ; let it be the common property, the material of all students, and then let them all try their hands at interpreting it. The new plan has countless advantages. On the old system a monument never appeared unless it stood committed to a theory ; compromised

* Antike Denkmäler herausgegeben vom Kaiserlichen Deutschen Archäologischen Institut. Band I. Erstes Heft (1886). Berlin : Verlag von Georg Reimer. 1887.

from the very outset, it may be, by false opinion; it was almost impossible for a student to approach it with an unbiassed mind. Now he starts clear,—the monument appears unaccompanied by So-and-so's monograph, which he felt bound to read. Further, we hold it an excellent discipline for those who actually publish the monument to be compelled to hold their hand,—to let the plates appear and reserve their opinion.

So much for the general principle, which will, we believe, go far to advance archæological science, and improve its method. It remains to say a word as to the plates. We shall briefly describe their contents; as they are unaccompanied by theory, we shall be spared the necessity of criticism. The plates are twelve, and the Direction promises the same number each year. Naturally, in a first issue, the editor has tried to make his selection a representative one. For architecture, we have a plan by Dr. Dörpfeld of the newly-discovered Athene temple on the Acropolis; for sculpture, a marble head from Berlin, and the two notable bronze statues recently found at Rome,—the boxer and the portrait statue, to both of which at the time of discovery we drew attention. For the, so to speak, literary-monumental (if we may coin the expression) evidence of art, we have a fac-simile of Carrey's drawings of the Parthenon, and also those known as the Anonymous. As we shall not return to these, it may be said at once that the Institute has conferred the greatest boon on the educated world at large by publishing these fac-similes. Every discussion on the Parthenon marbles involves their consideration, and though each archæologist studies the originals of the drawing, which are readily accessible in the Bibliothèque Nationale at Paris, still he cannot hold them in his eye, and constant careless reproductions have made the stock illustrations in handbooks of Greek art practically worthless. We should like to see facsimiles of these drawings framed and set up in the Elgin Marble room of the British Museum.

To continue, for terra-cottas we have a unique series of Corinthian votive tablets from Berlin; for vases, a *re*publication, much needed, of the Berlin Sosias vase; for wall-paintings, a beautiful fresco fac-similed in colour from the Villa of Livia; and for jewellery, a series of gold ornaments found for the most part in Ithaca. It will be seen that though Berlin is well represented, Italy is by no means neglected We can note in detail only a selection of the more important plates, and first the head of Athene Parthenos (Tafel 3). The head belongs to Dr. von Kaufmann,—we presume of Berlin, but this is not stated. It is matter for congratulation that the Direction concerns itself with private collections; public collections are moderately secure for posterity; monuments of interest in private possession should at all costs be promptly secured for publication. The head is of fine-grained Greek marble, and was found in the garden of Sallust, at Rome. It is reproduced with the colouring in fac-simile, and the plate is a marvel of softness and delicate finish. Nevertheless, there is about the head a certain hard mechanical air which bespeaks late work. Its great interest consists in the fact that it is, undoubtedly, an echo of the chryselephantine Parthenos, though an echo far inferior to the well-known gold medallion of the Hermitage, with which, however, it should be carefully compared. The remains of colour on the head are of great interest. It is noticeable that the flesh parts not only have no colour now, but almost certainly never had, as the skin is worked to a high polish, whereas on the coloured parts it is left rough; the lips appear to be the only exception; they are left rough and no doubt bore colour. The helmet appears to have been painted gold colour, with the cheek-pieces brownish violet, the hair and eyebrows brown, the iris of the eye dark brown. The head only is published, but a few other unimportant fragments of the statue have been discovered, among them a fragment of a foot wearing a sandal and standing on a plinth. Rumour says that a portion of the torso of the statue was found and fell into the possession of a collector in Austria or Hungary. Possibly some day the various fragments may be brought together.

Undoubtedly the most interesting of all the plates are Nos. 7 and 8, which are devoted to the Corinthian terra-cotta tablets. It has long been well known that the Berlin Museum possesses a unique series (about 1,000) of these curious monuments. With the single exception of the Louvre, we believe, no other Museum possesses any specimens; it was, therefore, of the first importance that they should be published, and it is remarkable that a Museum so energetic as that of Berlin should have left so obvious a duty so long unperformed. The tablets were all found (in 1879) near Pente Skuphia, a village about half an hour south of the Acrocorinthos. They are painted, some on one side, some on both, in the style of early black-figured vases. From the inscriptions, which are painted for the most part, they may be dated as of the seventh century B.C. They seem to have been for the most part votive offerings to Poseidon or Amphitrite hung up in their shrines. In many of the tablets the holes for suspension remain. There must have been at Corinth a regular *fabrique* for these anathemata. Anything quainter and more curious than the drawings of the designs on the tablets it would be hard to conceive; no description could give any idea of their formal delicacy. The most frequent inscription is just the name of the god and goddess, in Doric form,—Ποτειδᾶν, Ἀνφιτριτά. The name of Amphitrite seems to have been a crux to the potter, as the spelling fluctuates freely. Sometimes we have the name of the worshipper, *e.g.*, "Eurymedes dedicated me" (Ευρυμήδης μ' ἀνέθηκε), written "Boustrophedon." The representations are not, however, confined to the sea god and goddess; we have Athene and Herakles and Trojan heroes, Hermes, Centaurs,—in fact, a whole world of mythology. Naturally sea-monsters abound, but land scenes are not absent. We have a fox looking up into a tree, after the fashion of Æsop's fable, men labouring at a quarry, a sculptor and a potter at work, a vintage,—in fact, a whole series of scenes from Corinthian daily life. For the early history, not only of ceramography, but of mythology, and also manners and customs, these tablets will have henceforth to take a high place. We may add that many of the most important analogous tablets in the Louvre have been recently published in the "*Monuments Grecs*, publiés par l'Association des Études Grecques," Nos. 11-13, with an interesting commentary by M. Collignon.

The plate of most sensational beauty is undoubtedly "*Tafel* II., *Wandbild aus Prima Porta*." Prima Porta owes its modern fame to the excavations begun in 1863, which resulted in the discovery of the Villa of Livia, "*ad Gallinas albas*," "at White Hens." Suetonius (Galba I.) tells the story of how when Livia was on a visit to her country estate an eagle let fall into her lap a white hen with a laurel branch in its beak, and how from this hen a wonderful breed of white hens was reared, which gave the villa its name. It is in the largest room of this villa that the wonderful wall paintings, in part reproduced in the *Denkmäler*, are taken. The originals are still of marvellous freshness. The piece reproduced is from the north wall. The design represents an open-air garden. Above is a sky of intense blue. The garden is surrounded by a sort of palisade, on which perch delicately-drawn birds, one apparently a stork; within are tall trees, among which oranges, palms, and quinces are conspicuous, and about them is a thick undergrowth of flowers, red, yellow, and pale purple. Birds are everywhere perched, some in impossibly delicate balance, on the extreme end of delicate sprays; some, with a fair amount of naturalism, on the trunks and twigs of trees. The whole effect is very lovely, after the fashion of Pompeian loveliness. Probably only the great expense of a coloured reproduction has left this wonderful wall painting so long unpublished. The *Monumenti* have, of late years, been famous for the sumptuousness of their coloured plates. The *Denkmäler* shows certainly no signs of falling off. We may add, in conclusion, that the *Denkmäler* very wisely is protected by a portfolio, which renders binding superfluous. The *Monumenti* only appeared with a quite inadequate paper covering.

NOTES.

THE report of Professor Carnelly, Mr. Haldane, and Dr. Anderson, on the carbonic acid and organic matter in the air of dwellings and schools, published in the Transactions of the Royal Society, gives a great deal of very valuable information, the result of carefully-conducted tests, in regard to the nature and degree of the impurity of the air in inhabited buildings under various circumstances, as compared with the normal condition of the external air. The statistics given, and the illustrations from microscopic examinations, are of interest to all who wish to get further and definite information as to what kind and what proportion of impurities are to be found in the air we breathe under various circumstances; but the most significant point for the consideration of architects is that the results are, in the great majority of cases, decidedly in favour of those schools which were mechanically ventilated. Out of about sixty rooms examined, the average of carbonic acid in naturally ventilated rooms, as compared with those mechanically ventilated, was as 18·6 to 12·3, the average of organic matter as 16·2 to 10·1, while at the same time the average temperature was 6½ degrees higher (62° as against 55°·6 Fahrenheit) in the mechanically ventilated rooms. These figures speak for themselves; and while we have long recommended mechanical ventilation as always more sure, effectual, and manageable than what is called natural ventilation, we find here a decisive corroboration as to its superior chemical results on the atmosphere. The species of mechanical ventilation used in the schools examined (in Dundee) is described in the report as "air blown by fans over hot pipes." To have produced the same standard of purity in the air by the ordinary methods of opening windows, &c., the authors remark, "would have reduced the temperature to a very uncomfortable and dangerous degree." We draw attention to this point as specially bearing on the question of the ventilation of buildings, but the whole report,* which is full of valuable information, should be read by all who are concerned about the sanitary condition of buildings.

JUDGING from the Annual Report of the Railway and Canal Traders' Association, which has just been published, that energetic body has had no small share in keeping the railway rates question prominently before Parliament and the public. We notice in the Report several recommendations for the amendment of the Government Bill which do not seem to have been adopted at present, but which would be very useful. For instance, the insertion of a clause providing for the disclosure of all rebates, drawbacks, and similar allowances made by railway companies, is advocated. These allowances answer to the special trade discounts enjoyed by favoured customers in commercial transactions, and, as the publication of rates is important, and, seeing that such publication would be of little value if there existed at the same time a secret list of special terms, it seems to follow that it is equally important that some such provision as that indicated should be made. In other quarters proposals have been made not so intimately connected with the principles of the measure, and which, perhaps, it would be unwise to persist in. Such, for example, as the resolution passed at a Kensington Vestry meeting:—"That this Vestry will endeavour to get a clause inserted in the Railway and Canal Traffic Bill to take town refuse for any distance not exceeding ten miles for one shilling per ton; for every additional mile one halfpenny per ton beyond that distance." However desirable this arrange-

* Published by Trübner & Co.

may be, the expediency of endeavouring to attain such an end by means of the Government Bill is questionable. The supporters of railway reform find that there is a great deal to do in the House of Commons before the Bill, as it at present stands, will do much to advance their views.

THE names of eighty-five firms and individuals appear in the Edinburgh Post-office Directory under the designation of "Architects." Of that number thirty-six applied for copies of the instructions to be observed in the competition (which was confined to local architects) for the new Public Library. These instructions contained a stringent clause against the divulging of anything which might lead to the identification of any design with its author, and this condition appears to have been rigidly adhered to. The designs were to be received on the 1st of June, and are to be hung in the galleries of the Royal Scottish Academy. Mr. Alfred Waterhouse, R.A., has been appointed assessor, and after he has examined the plans they will be open to the public for a week.

THE case of Wigram *v.* Fryer, just decided by Mr. Justice North, does not carry the law of light in regard to the point decided much further than it was before the decision of the case. The action was brought to restrain the erection of buildings in Shaftesbury-avenue which were authorised to be made by certain Acts of Parliament, and the point at issue was whether the infringement of light in such a case was a matter to be dealt with by injunction or one for compensation under the Lands Clauses Acts. The decision of Mr. Justice North is a confirmation of the law as laid down in Roscoe's "Digest of the Law of Light," p. 46, which is to the effect that "a person, the light of whose house is disturbed by works in course of execution by a public body created by the Legislature, and to whose undertaking the provisions of the Lands Clauses Consolidation Act are applicable, cannot bring an ordinary action for damages, or proceed for an injunction, but must proceed under s. 68 of the Lands Clauses Act, 1845, to obtain compensation." The case of Wigram *v.* Fryer seems to confirm this, and to slightly enlarge it, putting a lessee under a public body in the same position as the body itself. When the case is reported at length in the Law Reports we may again have a word to say on it.

TO the last number of the *Bulletin de Correspondance Hellénique* (xi., 3), M. Holleaux contributes an interesting paper on the series of archaic "Apollo" statues found in the recent excavations on the site of the Temple of Apollo Ptoos, in Bœotia. From a careful analysis of the several specimens he deduces the following conclusions. The "Apollo" type, though found in other parts, was undoubtedly most prevalent in Northern Greece and in Bœotia. As regards Bœotia, one sanctuary alone, that of Perdico-Vrysi, has yielded eleven replicas. Further, the chronology of the series can, M. Holleaux thinks, be determined. The earliest specimens of a style contemporary with that of the Orchomenos Apollo belong, in all probability, to the seventh century B.C. The latest specimens are not earlier than the third quarter of the sixth century. Finally, the type was, he thinks, presumably brought by Dipœnis and Scyllis to the Peloponnese, but received special development in Bœotia, and bears the stamp of local taste. We can, in fact, from this series of Apollo statues, in part venture to reconstruct the early Bœotian school of sculpture.

THE *Bulletino della Commissione Archeologica Communale di Roma* (xv., 4) publishes in phototype two Greek grave reliefs recently found at Rome, which, from style and subject respectively, are specially interesting. The first is of Pentelic marble of the finest work, the style just touched with lingering archaism. It represents a seated woman and an attendant maiden. Tombstones of this date, when found in Rome, are, of course, valuable evidence as to the archaising taste of Roman connoisseurs. The second relief is of late date, and the interest attaching to it is rather that of subject. In the upper part of the slab a horseman on a galloping horse is represented; below is the inscription to the dead man, whose name, it appears, was Menippos (the good horseman). We have here, Professor Gatti thinks, a fresh instance of the play on words which occurs not unfrequently on gravestones,—a sort of sculptured pun, in fact. Of these he collects a long and amusing list; for instance, a man of the name of Aper has on his tombstone a boar, with the inscription, "Innocuus Aper ecce jaces." Decumius Mus has two small moles; Felicla has a cat; and so on.

A GREAT deal has been written and said as to the restoration of the right arm of the Hermes of Praxiteles, and new evidence,—unhappily never decisive,—is always turning up. In the *Jahrbuch* of the Russian Archæological Institute (1887, ii., 1), a Pompeian wall-painting is published, which is worth noting in connexion with the question. It represents a satyr holding the infant Dionysos in Praxitelean fashion, on the left arm; the right is upraised, and holds a bunch of grapes. A general analogy to the Hermes no one will deny; but we cannot agree with Dr. von Rohden that the question of the restoration of the statue is in any way settled by the Pompeian painting. What is appropriate in an Alexandrian pictorial translation might be quite unimaginable in a sculptured original. We do not deny the interest of the fresco, but we object to its evidence being regarded as conclusive. Why more conclusive than the seventeen instances (collected by Mr. A. H. Smith, "Journal Hell. Studies," iii. 90), in which the Hermes holds a caduceus? The Pompeian child carried is not even a Hermes.

UNDER direction of the late Mr. Octavius E. Coope's executors, the freehold Berechurch Hall estate, Essex, is to be put up for sale at anction on the 13th of June. This property includes a park, woods, and land both arable and pasture, with good shooting, covering in all about 3,300 acres, situated two miles southwards of Colchester. The total rent-roll, comprising the annual value of the house, is estimated to yield 3,700*l.* per annum. To this property appertain the advowsons of Berechurch and of Layer-de-la-Hay, together with the Blind Knights' manor or lordship in the latter parish. The land lies in sundry parishes about the port of Wyvenhoe, on the Colne estuary, whose names testify to the early settlements of the Danes in that locality.

AT eight o'clock in the morning of Whitsun Day last the Pitt dole of sixty loaves was duly distributed in the schoolroom, St. Botolph's, Bishopsgate Without. Before the building of the North London Railway terminus, at the end of Broad-street, the recipients of the bequest used to attend in a private garden which had been an ancient graveyard, being, as is not commonly known, the burial-ground appertaining to Bethlehem Hospital. A priory of canons, with brethren and sisters, was founded here in 1246, by Symon Fitz-Mary, who was a sheriff for that year, and endowed it with all his lands in the parish. Within 100 years of its establishment the priory, dedicated to St. Mary, of Bethlehem, is named as a hospital (1330); in 1346 it passed under Civic protection; and in 1546 the Corporation bought the patronage, property, and buildings, with money left, *ad hoc*, by Stephen Gennings, citizen and Merchant Taylor. At what epoch the hospital first became appropriated to that particular use with which its style is most generally connected cannot be easily determined. This, however, is known: the canons (distinguished by the star of Bethlehem on their gowns) were required to supply lodging and entertainment for the Bishop of Bethlehem whenever he visited London. Moreover, we read in Butler's "Lives of the Saints" that to the monastery which St. Theodosius set up near to Bethlehem in Judæa, *circa* 520 A.D., were annexed three infirmaries: one for the sick, another for the aged and feeble, and a third for the mentally afflicted. It was certainly known as an asylum for lunatics by the beginning of the fifteenth century, when, as Stow tells us, "a King of England not liking such a kind of people to remain so near his palace," had caused certain lunatics to be removed from Charing-cross to Bethlehem in Bishopsgate Without. The original site, indeed, in St. Martin-in-the-Fields parish, continued to belong to the Hospital until 1830, when it was exchanged with the Crown and thrown into the ground which was required for improvements at Charing-cross and in West Strand. But after the Dissolution, when Henry VIII. confirmed the City's purchase, Bethlehem became the "Bedlam" which it has been ever since. In 1675-6 a new hospital was erected in Coleman-street Ward, outside of the wall, on a plot of two acres and a half that was leased to the Governors by the Corporation for 999 years at a rent of 1*s.* per annum. Designed by Robert Hooke, the celebrated mathematician, in his capacity of City Surveyor, and having cost 17,000*l.*, the new buildings, being 540 ft. by 40 ft., abutted against the northern side of the London-wall. The open ground which appears in the views by White, J. Bowles, T. Maurer, and others, is Moorfields, now covered by Finsbury-circus. The two wings for incurable patients were added in 1733. A good picture of the entrance-gates, bearing Cibber's two sculptured figures, may be seen at the Foundling Hospital; it was painted by Hayley in 1746. Cibber's handiwork, as restored by Bacon, we last saw in the South Kensington Museum. Despite Pope's oft-quoted couplet, these "brazen brainless brothers" are carved in Portland stone, stained and painted. This is the hospital delineated by Hogarth in his closing scene of his "Rake's Progress." The present site of 11 acres in St. George's-Fields, Southwark, which includes the once famous Dog and Duck Gardens, was taken in 1810, and the hospital built in 1812-5 at a cost of 122,572*l.* 8*s.*, most of which was provided by grants of public money and subscriptions made by various public bodies and private individuals. The wings and rear premises were added fifty years ago by Sydney Smirke; the dome in 1845. We should add that in 1866 the Great Eastern Railway Company paid to the Hospital Governors a sum of 61,000*l.* for their property in Bishopsgate Ward Without whereon to build their Liverpool-street terminus.

A BUILDING fund is opened for the projected new premises in Shaftesbury-avenue of the French Hospital and Dispensary. Her Majesty has consented to become patron of this charity, and has sent a donation of 50*l.* to the fund. Mainly by the exertions of the chief physician, Dr. Vintras, and the late M. Eugène Rimmel, the existing hospital in Leicester-place was established twenty years ago for the benefit of all foreigners speaking the French tongue. With room for but thirty-five inmates, it has relieved, since 1867, as many as 4,400 in-patients, and over 100,000 out-patients, representing some thirty diverse nationalities. Shaftesbury-avenue is being rapidly appropriated for institutions of a public or quasi-public character. To the inevitable new theatre, for Mr. Hollingshead, we have already adverted. On the afternoon of Tuesday, May 23rd, were laid there three memorial-stones for the Baptist chapel which, at a total cost of 5,600*l.*, is designed to accommodate, on the floor and in the galleries, 500 persons.

THE ancient palace of the Archbishops of Canterbury at Maidstone has been purchased by the town for the very moderate sum of 2,000*l.*, and will be devoted to some purpose in connexion with the town; but what that purpose shall be is not yet decided, but it will be in all probability a public library. Maidstone already possesses a museum and a respectable collection of antiquities. The palace was begun, it is said, in 1348 by Archbishop Ufford, and completed by Simon Islip. The present structure is late

fifteenth-century work, and bears a remarkable resemblance, as regards style, to some of the Scottish baronial castles. The plan and general features are Gothic, but there are Italian details in some parts which show the influence of the Renaissance; these Italian details are used sparingly, and with an evident preference for the older style. The palace, which is at present empty, is divided into two portions, which were until recently used as dwelling-houses. Some additions have been made to adapt the building to modern uses, but its main characteristics remain unimpaired, and it will not be difficult to restore it to something like its original condition. There is a fine central hall, measuring 36 ft. by 24 ft., with the original fireplace and fine oak panelling, and a Jacobean staircase of unusual design.

FORMING a conspicuous feature on the left hand of one walking along the main road from Brixton to Streatham Hill, stand the buildings recently vacated by the Royal Asylum of St. Ann's Society. The Society, having removed to their new schools by the Junction Station at Redhill, Surrey, have put these premises up for sale. The entire property, which is freehold, covers more than 2½ acres, and includes the principal block, a master's house, an entrance-lodge, gardens, and playground. There is room here for a college, or the like thereto, of nearly 400 inmates.

THE opening of the Terrace Gardens at Richmond by H.R.H. the Duchess of Teck the other day was an event fully justifying the local rejoicings,—rejoicings which were no doubt shared by some of those "economical" ratepayers who were at first opposed to the purchase of the property by the Vestry. To have allowed so lovely a spot, commanding such charming views, to be sacrified to bricks and mortar would have been a sad blunder. With all that has been done in adapting the site to the purposes of a pleasure-garden there is little to express disapproval, if we except the very commonplace, we may even say ugly, cast-iron fountain on the upper plateau. This fountain, we hear, is only a temporary one. The *Thames Valley Times* of the 25th ult. gave an admirable illustrated account of the gardens. We wish we had good grounds for hoping that the example of the Richmond Vestry in saving these gardens would be emulated by the Corporation of London and the Metropolitan Board of Works in securing such valuable breathing spaces as Clissold Park (Stoke Newington) in the North of London, Brockwell Park (Herne Hill) in the South, and Ravenscourt Park (Hammersmith) in the West. If anything could justify the retention of the Coal and Wine Dues for a few years longer, the acquisition of these large and finely-wooded spaces, fast becoming hemmed in by bricks and mortar, would do so.

A COMMITTEE, whereof Mr. H. R. Williams, of Hornsey, is chairman, has been appointed for effecting the purchase of Alexandra Park and Palace as a Jubilee Memorial for the public benefit. We hear that there is fair expectation of the project being accomplished. Meanwhile the Palace, having remained closed for a period of nearly two years, will, until the end of July next, form the scene of a series of popular *fêtes* and exhibitions, under the management of Mr. H. W. Hayward.

THE exhibition of paintings at the Albert Hall contains, among a good deal of uninteresting matter, some clever paintings which are new to us, and some, such as Mr. H. Moore's "Outside the Harbour," which are none the less welcome for not being new. One bay is occupied entirely by landscapes by Mr. A. MacCallum, a painter whose style of landscape is hard and artificial, but whose works when seen together produce an impression of more ability and originality than has always been credited to them; the "Pass of St. Gothard after a Storm" is a fine and effective work, and "Golden Moments," though very artificial, is, at all events, a powerful scenic effect. One bay is devoted to architectural drawings, and the quality of these is certainly high. The selection includes eight of the best of Mr. Aitchison's designs for coloured decoration which have been seen in the Academy in various years, and which students of this kind of work will find worth studying collectively.

IN referring last week to the report of Mr. Walter Crane's lecture at the Society of Arts, we expressed a doubt whether there were really any such thing as a "system of designing" among us at present. From a letter of Mr. Crane's in the *Times* of May 30, it appears that he is of the same mind, and that the condensed report of his lecture misinterpreted his meaning in representing otherwise.

ARCHITECTURE AT THE ROYAL ACADEMY.—VI.

1677, "Design for Stained Glass: Presentation of Infant Saviour in the Temple," Mr. G. Parlbey. A small design for a Renaissance stained-glass window, with an architectural canopy of the kind unfortunately usual in modern windows designed in Renaissance style, viz., a kind of traduction of Renaissance details into a shape suitable for decorative treatment,—very elongated wiry columns, &c.; but otherwise this is a very good design, harmonious in colour except for the yellows (also apparently inevitable in design of this class) in which part of the architecture is shown, and the figure of the Virgin is a very pleasing one, above the usual average of stained-glass figures.

1678, "The High School, Stirling: New Wing," Mr. J. M. MacLaren. A bold application of Scotch castellated architecture to an educational building; the massive square tower, with its circular attached turret, is, at all events, very picturesque; and the drawing should be noted as a good specimen of architectural pen sketching, broad in effect and with plenty of whites left in it, but marked by precision of line where required.

1684, "Lower Ince Church, Wigan," Messrs. Paley & Austin. A careful pen interior of a church in pure Early English style. A plan is wanted to make it quite intelligible. The two lofty arches on the left, rising nearly to the roof-springing, convey the idea that there is a double transept; at all events, there is apparently ample space given in floor area and in height for the organ, which is partly shown, and this is in itself a good point: we are always glad to see a practical protest against organ-chambers. The church is of very solid construction, as everything of the kind by its architects usually is; the heavy and unadorned collar-beam, however, cuts very awkwardly across the lines of the wooden wagon ceiling; the two, in fact, seem in no way to belong to each other, and the impression is as if the collar-beam were an old piece of work, and a new ceiling had been put irrespective of it.

1685, "Constitutional Club, Northumberland-avenue," Mr. R. W. Edis. The drawing is by Mr. Raffles Davison, and shows the whole of the long lines of cornice mouldings, &c., conscientiously lined in by hand. The general effect of the drawing is very satisfactory; there is a fine texture about it, but a little want of force and finish in the details, and a little too much of hatching and scratching of shading in the lower portion, which always, to our thinking, takes away from the firmness and solidity which ought to characterise an architectural drawing as a representation of a new building. The drawing is a picture in pen and ink, in fact, rather than an architectural draughtsman's drawing: all the better, some will say; but we confess we like to see detail thoroughly shown in an architectural drawing. Of the building itself we have spoken before, and it is familiar enough to every one as one of the finest and most picturesque of the recent great blocks of building which have been erected as clubs, and which, in matter of size at all events, quite throw the old-established London clubs into the shade; and certainly such a building as this has more of colour and interest than the cold and correct fronts of the "Reform" and the "Conservative."

1688, "Design for an Entrance to a Public Park," Mr. E. H. Sedding. This was a design in competition for one of the Royal Academy prizes, and we commented on it when it was exhibited with the other designs sent for the various medals and prizes; it is a highly original design, and deserved a place here, though we cannot say we think it very beautiful. It is consoling, however, to look at a design which is not a copy of something else.

1687, "Rheims Cathedral," Mr. Arnold B. Mitchell. A careful and very refined drawing of the front, in line, and with shadows put in with washes of Indian ink tone. The effect is very delicate, but a little artificial. It is neither an architectural drawing pure and simple, nor is it a representation of the actual effect of the building. It looks very nice, however, which is its best defence.

1689, "Brasenose College, Oxford; new Front and Gateway Tower in High-street," Mr. T. G. Jackson. Published, as it happens, among our illustrations of this week, though not by any deliberate purpose. The fact, however, saves the trouble of description, and we may refer the reader to the lithograph on another page. The style of drawing employed does not do the best for the design. It is a sepia drawing, rather flat in effect; the brush has been used too heavily and uniformly over the shadowed portions, and the whole, consequently, wants surface and relief. The style is a hard type of Late Gothic, which we love not; the tower, with its lantern carried on flying buttresses, is an effective feature. We must confess, however, that its architect has exhibited in this gallery a good many things that we have liked better than this.

1692, "St. Bride's Vicarage," Mr. Basil Champneys: a sepia drawing of this new vicarage in the old London eighteenth-century style, with the steeple of St. Bride's rising in the background. We should have thought Wren's steeple might have suggested a little more varied and picturesque treatment of the vicarage attached to it. The latter is, however, an exceedingly good house of its kind, and very well planned in its limited space; plans will be found in the *Builder* of May 22, 1886 (p. 759), together with a reproduction of this same drawing, which was, in fact, a drawing made for this journal from a photograph, the photograph having distorted the stages of the steeple in the background too much to be available as an illustration.

1695, "Proposed Church of St. Michael," Mr. P. J. Marvin. Where? We suspect this is a church in the air; but it is an excellent pen-drawing, at all events, showing an exterior view of a large and lofty church of Early Decorated type, with transepts and Lady-chapel, and a lofty tower and spire at the crossing. The design looks out of date with recent ideas and tastes. It is the kind of church Sir Gilbert Scott liked to build when funds were forthcoming.

1698, "House at Palace Court, Kensington," Messrs. Harvey & Bernard Smith. The entrance is effectively managed, under a large and deep archway. The strongly-marked rustication and quoins are too pronouncedly "Classical" for the general style of the building, just as the strong-ruled shadow-lines on them are out of keeping with the freer touch of some of the other portions. They look as if they had been filled in by a pupil preparatory to the completion of the drawing by another hand.

1697, "Chimney-corner in Dining-room, Stonelands, Sussex," Mr. E. W. Mountford. An artistic little pen-drawing, though there is certainly not very much in the design.

1699, "Graythwaite Hall, Windermere," Mr. R. Knill Freeman. A well-executed pen perspective of a Jacobean house of some extent, shown with a very high sight-line, almost a bird's-eye view. A plan would have added greatly to the interest of the drawing. In many points this seems an exceptionally pleasing and picturesque design of its kind, especially in the broad treatment of the spaces of wall between the pilasters on the garden front, where windows and wall panellings together form a combined design extending over the whole wall-area, framed in by the pilasters running from plinth to cornice. It is a kind of treatment not uncommon in old houses of the date of this architecture; but it has been very happily applied here.

1702, "Lodge at Flete, Devon," Mr. J. D. Sedding. Charming. A very nice pen drawing, and the lodge is quite a little bit of the poetry of building; it is a kind of thing one would certainly sketch if one came across it as an old bit of building; but there is no affectation of looking old about it; and the plan, shown in

the corner, shows that the picturesque outline of the house arises naturally from the picturesque disposition of the plan. The deep shadowed recess for the bench is very effective, and at the same time a useful feature in a lodge, where people may have to wait occasionally.

1703, "House at Tunbridge Wells," Mr. Jas. Neale. Another view of the house shown in No. 1673, already noticed; both are very good drawings, but considering the limited space at disposal for architectural designs, it might be thought that one illustration of this house would have been adequate; and our conclusion from finding both hung, would be that whoever selected the drawings did not look at them with sufficient care to see that these two represented the same building, and that favour simply goes by the general execution of the drawing, with little reference to the design.

1704, "Board School, Woodland-road, Lower Norwood," Mr. M. S. Bailey. Hung high; a boldly-designed block of building, and the architect has made the most of the now prevalent practice of building the ground-story of a Board school as an open arcade; the piers are deep and massive, and the arcaded-ground story gives a great deal of picturesque and effective expression to the whole. The contrast of windowed walls and blank walls is, we presume, the architectural expression of the practical duty of lighting from the side; it gives additional effect to the structure, at any rate; a good instance of effect growing out of the mere observance of practical conditions.

1705, "Memorial Window for St. James's Church, Piccadilly," Messrs. Ward & Hughes. Hung too high to see the detail well, it looks a good window of average Renaissance pattern; the wide decorative border has a good effect in itself, but it wants something to stop it,—or, rather, to commence it,—at the foot.

1706, "Stonelands, Sussex," Mr. E. W. Mountford. A nice pen drawing of a very pretty, homelike house, with low, mullioned windows; it looks, however, much more like a drawing of an old house than a design for a new one; but it suits the country it is in, at all events.

1707, "St. John's Church, Hampstead: new stalls, organ-case, and painted decoration on walls and ceiling," Mr. T. G. Jackson. The "painted decoration" can hardly be shown in a pen-line drawing; the general effect, the disposition and style of the decoration are shown, and we can imagine that, as executed in colour, it would be rich and effective; the methods of covering the various surfaces seem to be well balanced and contrasted. The organ-case has some richly-carved open-work brackets; the usual mistake is made, which nearly all designers of organ-cases make, of placing the larger front pipes in the centre and the smaller ones at the sides, thereby contradicting the necessary arrangement of the pipes on the sound-board. The drawing is a very clean, precise, and well-executed piece of pen-and-ink perspective.

"St. Mary Star of the Sea Church, Hastings," Mr. Basil Champneys. The principal drawing shows an interior of a Gothic vaulted church, shown in the old fashion, with bare stone floor, leaving the piers all visible clear of seating. The work aims apparently at being simply a correct piece of Gothic, and calls for no special remark; the reredos, with its double tier of open work, is unusual and effective. The drawing, a pen line one, is signed by Mr. Raffles Davison, who, we fear, must have suffered from want of time to do himself justice; it is far too scribbly in execution, and nothing like the way he used to draw. The two small exterior perspectives show both architect and draughtsman to better advantage. The exterior north-east view, with the small circular turret and open lantern at the top, is decidedly original, and so is the treatment of the west end in the other exterior view, with a broad traceried window divided up the centre by a solid compartment with niches and statues. A plan of the church is added.

1710, "Mansfield College, Oxford: Corner of Quadrangle," by the same architect as the last-named. A pleasant bit of Collegiate Gothic; without a plan and section it is not easy to understand the meaning of the expanse of blank wall between the lower windows and the dormers, on the right; it is picturesque in effect, and let us hope it has a reference to the practical arrangement of the building.

1712, "Decorative Painting for Ceiling of Drawing-room," and 1713, "Decorative Painting for Cove of Concert-room," both by Mr. J. M. Boekbinder. Clever work in a very faulty and vulgar style. The ceiling decoration is *di sotto in su*, showing, as we look up, a painted balustrade rising up above the modelled cornice of the room, over which is the open sky, with clouds and a number of pink genii kicking about in it with all the correggiosity of Correggio. It is well enough done, and (to parody a celebrated literary criticism) "for those who like this sort of thing, it is just the sort of thing they would like." The concert-room cove is in a more orthodox decorative style, being a flat composition representing a series of classical players on the sackbut, psaltery, dulcimer, and all kinds of music, in various degrees of nudity. In the centre is a winged Apollo (?) enthroned, and beneath him a draped seated female figure, fine in action and somewhat recalling the manner and feeling of Delaroche in this type of work. There are other good figures in the composition, which is bright in colour effect, and has a good deal of spirit; but somehow we cannot look at it without thinking what piquant variations Mr. Harry Furniss could play on it.

LETTER FROM PARIS.

PARIS is still in a kind of stupefaction from the shock caused by the Opéra Comique disaster, which has had the effect of again bringing under consideration the various precautionary measures, often before discussed, against such disasters in theatres.

It is melancholy to reflect, now that it is too late, that the disaster was foreseen and almost predicted. It is barely a month since a Deputy called attention in Parliament to the defective construction of the building, the insufficiency of its exits, and the absolutely abnormal accommodation for the actors and *employés* in two blocks of buildings seven stories high, and connected above the proscenium by narrow wooden bridges. On his side, the Minister of Fine Arts declared that, according to statistical precedent, the Opéra Comique was bound to be burned, and that if the fire took place during a performance there would be a dreadful catastrophe. This plain statement was received with laughter by a Chamber which attached no importance to it, and preferred turning the ministerial prophecy into a joke rather than voting funds to enlarge and alter the theatre.

A heavy responsibility rests with the Government for not having insisted on the regulations called for by public opinion, after the disastrous fires at the theatres of Vienna and Nice, and which should have been strictly observed everywhere without paying any attention to the complaints made on the score of expense; and the neglect of the Government is the more culpable in the case of a theatre which enjoys a State subvention, and is thus to some degree an official establishment.

It is not sufficient, however, to insist on a fireproof iron curtain to cut off the stage from the house, which, in the confusion accompanying an alarm of fire, always somehow fails to act; nor to open some new doors, or establish oil-lamps in the corridors. Security must lie in the construction itself, and it is to the architect that appeal must be made to build with uninflammable materials, to multiply the means of access and render them easily accessible, to replace gas by electricity, isolating the engines in vaulted cellars.

This is not the first time that the Opéra Comique has been burned. It was first built from the designs of Heurtier, architect also of the theatre of Versailles. The works were commenced in 1781 and completed in 1783. This house having been burned down in 1838, M. Carpentier was commissioned to rebuild it, and the new theatre was inaugurated on May 16th, 1840, by the first representation of the "Pré aux Clercs." This house, which seated about 2,000 persons, was esteemed one of the most elegant in Paris internally. The exterior façades, which the fire has spared, are very sober in regard to decorative treatment. Towards the Place Boieldieu there is an Ionic portico.

The Opéra Comique, it is expected, will rise from its ashes completely transformed in its arrangements, in accordance with the demands of modern science. But what is to be done to safeguard the other Paris theatres which present the same dangers? Some of these, too, as the Bouffes Parisiens and the Palais Royal, are so closely hemmed round by other buildings that a fire in them would be a danger to their whole neighbourhood also.

We have another misfortune to lament in the death, at Cannes, of Ruprich-Robert, one of the most active and learned members of the Commission des Monuments Historiques, of which he was Inspector-General. It was for the Commission that he made the splendid drawings so justly admired in the *Salons* of 1844, 1855, 1868, and 1878, among which we may specially mention that of the Templars' Church at Montsaunès, the Cathedral of Seéz, the Church of St. Sauveur at Dinan, the Church of Bernières, and that of Fresne-Camilly.

Victor Marie Charles Ruprich-Robert was born at Paris on February 18th, 1820, and, after studying in the *atelier* of Constant Dufeux, he entered the École des Beaux Arts in 1838. Appointed first as architect to the dioceses of L'Orne and Calvados, he became successively professor of ornament in the École National de Dessin, and subsequently was appointed "Dessinateur du Mobilier" to the Crown, and designed for Napoleon III., among other things, the corona chandelier given by him to the Abbey of Einsilden in Switzerland. He obtained successively a "seconde médaille" in 1855, a Chevalier's cross in 1861, a "première médaille" in 1878, and the cross of Officer of the Legion of Honour in 1879. The Government had appointed him to direct the excavations of the "Arènes de Lutèce." An assiduous worker, and with a facile pen, he contributed extensively to the *Revue Générale de l'Architecture*, and in spite of his multiplicity of occupations, found time to bring out numerous publications, among the most important of which were the "Flore Monumentale," published in 1866, and the interesting monograph of the Church and Monastery of Val de Grâce, published in 1875. To his great work on Norman architecture in Normandy and England, which was hardly complete at the time of his death, reference has already been made. Among his practical works may be mentioned the construction of the Church of Flers, the important work for the restoration of the Château d'Amboise, the Church of Ste. Trinité at Caen, and the Church of Ouistreham in the Calvados diocese. Ruprich-Robert was what might be termed an archæologist *passionné*. As a man, he was much liked, and has been generally regretted.

We hear also of the death of M. Emile Vernier, a landscape-painter of great merit, who received medals in the *Salons* of 1869, '70, '79, and '81. He made a long stay in England in recent years. He had exhibited in the *Salon* of 1883 a view on the Thames; in 1885 a view on the coast of Cornwall; and last year a view at St. Ives. The present *Salon* includes two works by him: "L'Ile Bouin, Vendée," and "Vieux Maisons au Croisic." Vernier died at the age of fifty-eight.

While the *Salon* continues to attract its crowds, three other exhibitions have opened during the month of May. There is first, in the Galerie Petit, the sixth "International" exhibition of painting and sculpture, in which Impressionist art takes a very prominent place. Why do MM. Sisley, Pisaro, Claude Monet, &c., always see nature through a violet veil? Trees, houses, sea, and mountains are all informed with that colour, apparently a symptom of that peculiar malady of the vision called Daltonism. M. Besnard's "Panneaux Décoratifs," again, are really too eccentric. M. J. Lewis Brown exhibits some clever works, and M. Cazin some splendid landscapes; but then M. Cazin is a good deal more than an impressionist. Among other things to be mentioned are a scene in a cabaret by M. Kroyer, a pretty picture of the Luxembourg Gardens by M. Edelfeld, two good portraits by M. Egusquiza, and the cattle of M. Vervée.

The second exhibition referred to is that of the works of Théodule Ribot, works in black and white, etchings, effects of light and shadow, &c. The exhibition in Rue Lafitte includes about 100 pictures and sketches, figures, portraits, still life, all showing the same marked originality, and the same search after truth and nature.

Most interesting of all, however, is certainly the exhibition of the works of Millet at the École des Beaux Arts. Millet, whose life was nothing but a hard struggle defiantly endured, is now, after his death, universally hailed with a full recognition of the greatness of his genius. There are only sixty-seven pictures, 175 drawings, and a few etchings, but this small

exhibition reveals at every step the powerful genius of this great painter of rustic life, who had not always bread for his children, and whose paintings command showers of gold now. Among those exhibited is the celebrated "Angelus," which at a recent sale brought 228,000 francs, having been sold by the artist for 500. Among others are the "Gardeuse de Moutons," the "Vanneur," the "Dénicheurs d'Oiseaux," the "Glaneuses," exhibited in 1857, and popularised by engraving; the "Baigneuse Rustique," the "Tonte des Moutons," &c. Among the pastels, the "Récolte des Foins" is admirable in movement and life. Space alone forbids us to notice in detail this splendid collection, the proceeds from which are to go towards the erection of a monument which the town of Cherbourg is to erect to her great citizen, unrecognised while with her.

We mentioned lately that M. François Bonvin, the painter, had fallen under the calamity of blindness, and that a sale of his works had been organised to assist him. The sale has produced 35,000 francs, and, thanks to the generous confraternity of painters, the aged artist, more fortunate than Millet, can end his days free from the cares of poverty.

The voting at the Palais d'Industrie for the "Médailles d'Honneur" has rather surprised the public. In the section of painting it was expected that M. Roll would obtain the majority of votes, but the medal has been decreed by 122 votes to the "Vanqueurs de Salamine" of M. Cormon, as against only 57 votes to M. Roll. M. Tattegrain has obtained 38 votes, M. Henner 29, M. Benjamin Constant 27, M. Vollon 19, and M. Harpignies 10. In sculpture, M. Fremiet, whose "Héraut d'Armes" was illustrated in the *Builder* some time ago, has obtained the medal by fifty-six votes for his group, "Gorille emportant une Femme" (a pleasant subject, truly! though the talent shown in the work cannot be denied). In the section of engraving M. Courtry, a pupil of M. Gauchard and M. Flameng, has obtained the medal. His exhibits this year are "La Famille du Menuisier," after Rembrandt, and a portrait after Vandyck. In architecture M. Wable has obtained the medal for his design for an "Algerian Palace" or pavilion, prepared with a view to the Great Exhibition, and second medals have been given to MM. Devienne, Deglanne, Bonnier, Esquié, and Monnier; while MM. Louzier, Joannis, Debrie, Gontier, Touzet, and Balleyguier have obtained each a third medal.

The work for the Great Exhibition goes on slowly but steadily, without interruption so far from Ministerial changes. The long-talked-of construction of a museum of decorative arts seems to have entered on a new phase. The State is to abandon any claim to the ruins of the Cour des Comptes; and the Union Centrale des Arts Décoratifs is to engage to devote a sum of 2,500,000 francs to the immediate construction of a museum on the site of the said ruins, on the condition that at the end of thirty years the buildings and the collection they contain are to become the property of the State. If this scheme is adopted by the Chambers the works will be commenced at once. On the Quai d'Orsay will be disposed a gallery surmounted by an upper story lighted from the roof. The inner court of the palace will be covered in and surrounded by other buildings on the existing foundations, and the remainder of the site will be temporarily formed into gardens. If this is agreed upon, it will be certainly a change for the better in the aspect of this now desolate-looking corner of Paris. It is desirable also that the Government should come to some decision in regard to the Tuileries. As the actual Chamber of Deputies is now quite insufficient for the number to be accommodated, and the Palace of the Senate much too far from it, there is serious talk of creating a great legislative palace stretching along the Rue de Tuileries and uniting the Pavillon Marsan with the Pavillon de Flore. All the services of Parliament and of the Ministry of the Interior would be concentrated in this Pavilion, to which the Monument to the Revolution would serve as a façade. So far the idea is good; but unfortunately the plan submitted to the Chambers would include, apparently, the demolition of the Palais Bourbon, of which the materials and site would be sold for the benefit of the new structure. It is difficult to believe that such a piece of barbarism could be carried out as to destroy this building with its bas-reliefs of Cortot, Rude, and Pradier, which forms such an important part of the architectural decoration of the Place de la concorde, the design of which would be completely mutilated by such a step, against which it is to be hoped there will be an energetic public protest raised.

It may be noted that the famous Ministry of Arts instituted by Gambetta, and which had only an existence of a few weeks, seems to have come to life again; at least, there is an effort in favour of such an institution, emanating from the Société des Artistes Français, on the ground that the arts require to be more efficaciously supported and protected; and it is reported that there are petitions or demonstrations forthcoming, in the same direction, from a number of other artistic and literary societies, and even from the syndicates of the *ouvriers*. We see very little good likely to arise to art from any such institution, or, indeed, to any except the holders of some possible sinecures with large salaries attached to them.

NOTES AT THE AMERICAN EXHIBITION EARL'S COURT.

THIS Exhibition, which is sometimes spoken of as the "Yankeries," was opened on the 9th ult., but is still in a somewhat incomplete state. Pleasure has had the main attention: "The Wild West" and Tobogganning are ready and appreciated; so also is the "Switchback Railway," which is recommended to adventurous pleasure-seekers as affording "most fun to the square inch on earth."

There is an exhibit by the International Terra Cotta Lumber Company of Chicago, U.S.A., of porous earthenwares, which can be moulded to any shape, and used for building purposes; these are called under the several names of terra-cotta lumber, brickwood, cellular pottery, and wood-stone. They are formed from the burned products of earthy and vegetable matters, such as clays, clayey loams, sawdust, and cut straw, first made plastic by the addition of water in machine-mixing processes, subsequently pressed into any desired form by heavy power, and finally dried and burned as bricks are dried and burned. The vegetable matters in the dried compound, proportioned with clay in equal or greater parts, serve as fuel for burning the clay, none other being needed after ignition is effected, and when eliminated from the compound by combustion leave a brick-like residue so porous that its weight is from half to one-third the weight of common bricks, and the material can be nailed and worked with carpenters' tools; the specimens we saw seemed to cut readily with a saw, and were of a pale red terra-cotta in colour, and were only plain slabs similar in size and look to ashlar facing. It is claimed that this material is incombustible and adapted for the fireproofing of the interiors of brick and wooden houses, and can be used for the lining of chimneys, though we should have thought their porous formation would certainly require to be covered with cement or plastering of some kind, which would adhere remarkably well to such a material. It is further claimed that the insulating properties of the material against sound, heat, cold, and electricity are not to be excelled, and this we should think to be the case.

There is a wonderfully cheap and effective filter, called "The Boss Filter," the price being only 5s. It is easily attached to any moderate sized tap, say from ½ in. base to ¾ in.; it is made of metal, and is cylindrical, being about 2½ in. in diameter, with opening at the top for the nose of the tap to enter, and one at the bottom for the filtered water to pass out at. The tap passes into the opening at the top, and the filter is pressed tightly home to the tap, which then is compressed into or against a perforated rubber collar inside and secured by side screws. The water, passing at the top from a ¾ in. bibcock, comes from the filter very clear and very quickly, in about the same body as it would from a ½ in. bib (common way). We could not penetrate the confidence of the inventor, who showed it personally, far enough to find out the composition which formed its wondrous interior. He calls it "a special preparation or well-considered combination of the best known filtering media." Such a lengthy and mysterious compound could scarcely stand for charcoal and sand, we should think. If it but keeps away a few of the dire troubles that come from bad water, it is welcome and cheap. Messrs. Eaton & Co. are the London agents

There is shown some door furniture, "Pike's," that has an alarm concealed in the collar of the inner handle. Any one turning the outside handle to enter or open the door turns a little catch in the inside handle which strikes an alarum, and this alarm can be set so as not to sound if required. The same patentee is the inventor of the self-threading needle, which is already known in London. One side of the eye of the needle is cut through, and admits of the upper part bending in on the cotton being pressed against it, and the cotton at once enters the eye. The action is similar to that of the snaffle of a watch-chain.

Several (so-called) self-lighting gas-burners are exhibited, very similar in their construction, each having a small sentinel jet beside the larger one, and this small jet protected; no doubt jets of this kind are already familiar to some of our readers; and there are some with levers and chains, for hall-lights or public buildings. Mr. H. Fahrig, of Maskegon, Mich., U.S.A., and Hackney, has a series of these jets.

Mr. Pike, of New York and London, has another series. One of his is to be had for as small a sum as 2s. 6d. He is the patentee of the alarm door furniture and needle already referred to.

An improved plumbers' stove is exhibited by the Doane and Wellington Manufacturing Company, of New York and London. It is called the automatic cold-air pressure furnace. Naphtha or benzoline is used. The same patentees have what they call an automatic torch. This is a lamp for burning off paint. It produces a larger flame and greater heat than those now in use.

OBITUARY.

Mr. Henry Hill.—We regret to announce the death of Mr. Henry Hill, of Cork, who, during a long life, practised as an architect in that city. In 1839 his design for the Corn Exchange, Cork, was adopted, and about the same period he built the "Queen's Old Castle," a business establishment that is still a model of lofty proportions and good lighting. From that time he designed many churches, mansions, and other buildings, and was well known and highly esteemed throughout the South of Ireland. In recent years he was assisted by his son, Mr. Arthur Hill, B.E., but down to the last day of his life he took an active part in his profession. He died in his 81st year, and was interred in Cloyne Cathedral on the 30th ult.

Mr. W. Jacomb.—We regret to have to record the death of Mr. William Jacomb, the Engineer to the London and South-Western Railway Company, which occurred very suddenly on the 26th ult., at his offices, Waterloo Station.

Mr. W. B. Moffatt.—The death is announced at Summercourt, St. Enoder, Cornwall, on the 24th of May, of Mr. William Bonython Moffatt, for many years partner with the late Sir G. Gilbert Scott, R.A. Mr. Moffatt, who had been long ill, was 75 years of age.

THE DECORATIVE WORK OF VIRGILIUS SOLIS.

"Virgilius Solis was my name;
Through all the world extends my fame;
For artists many, form'd by me,
Acknowledge my paternity,
And call me father. I did ever
To serve them use my best endeavour:
I painted; graved with the burin;
Illumined, to make art alluring;
Design'd, to waken their ability;
And etch'd, to teach their hands facility;
And subjects traced on blocks of wood:
So no one as my equal stood
In executing works of art
With skill, refined in every part.
In justice, then, the voice of fame
Has given me Solis for my name;
For that imports that, like the sun,
I stand alone,—the only one.
When fifteen hundred sixty-two,
As Christians reckon, onward drew,
And years I counted forty-eight,
God pleased to call me from the state
Of mortal life; and His behest
Has number'd me among the blest."

IN this grandiloquent, but not very eloquent nor elegant, language, the versatile Virgil Solis is popularly supposed to have written his own epitaph. The voice of Fame has hardly, we fear, assigned to him precisely the same niche in the temple which he would have selected for himself; in this respect, however, he has not been treated more rigorously than the rest of us,—perhaps even with more leniency, for a

full measure of appreciation has always been accorded to his work; fame has ranked him, if not the greatest, certainly not the least, of that group of early German engravers known as "The Little Masters." In our issue of December 12th, 1885, Part II. of "The Decorative Work of the Early German Engravers," the short paragraph in which we referred to his work did Solis but scant justice. We were working at that time from the collection of prints in the Fitzwilliam Museum at Cambridge, and that collection is, unfortunately, somewhat deficient in examples of his decorative designs; but the continuation of our work in the Print Room of the British Museum has brought under our notice numerous specimens of it, and it is from these and from Regnard's invaluable but little known "Album" that the sketches illustrating our present article are taken.

Virgilius Solis was born at Nuremburg in 1514, and, according to his own account,—which, in this respect, may be taken to be accurate,—practised and taught almost every form of art; he died at the age of forty-eight, having executed an enormous quantity of work of every description. His decorative work is very interesting, and, apart from a number of cups which, in common with all other engravers, he designed for the goldsmiths, may be classified under three distinct heads: first, pure Renaissance ornament, in which he was not always very successful; secondly, Arabesque, in which he excelled; and, thirdly, a peculiar species of ornament, which, borrowing the word from Mr. Ruskin, we may call "blottesque."

Figs. 1, 2, and 3 are the best specimens we have been able to find of his pure Renaissance work, and they will serve to show how uncertain and variable his powers of designing in this style were.

Fig. 1 is one of a considerable number of similarly-shaped panels, which are the merest *pot-pourris* of Renaissance "items." Most of them bear the well-known signature,—the intertwined V and S; otherwise they might be passed by as the feeble attempts of some of his pupils. On the other hand, the little piece of flat jewelled metal-work (fig. 2) is gracefully conceived and well carried out. Fig. 3 is a more ambitious piece of design. The flow of the structural lines in the ornamental border are equal to the finest work of the best masters; but the charm of the design is sadly marred by the menagerie and one or two very badly-drawn flowers. Of his work in Arabesque, however, it is impossible to speak except in the terms of highest praise. Scattered through Regnard's Album there are innumerable first-rate examples of it, from which we have selected one (fig. 4). Solis acquired an astonishing facility of designing this graceful form of ornament, and though he was apparently able to produce any quantity of it, the merest fragment is marked by great originality. The sword-hilt (fig. 5) is a combination of rather weak Renaissance and graceful Arabesque. The outline, however, is exceedingly good, and the general effect is of considerable beauty, though it cannot compare with the elaborate hilt of Woeriot (figured Jan. 22, 1887), nor with either of the simple or elaborate ones of Holbein (figured Nov. 6, 1886).

The group of sketches given in fig. 6, contains three examples from a number of curious designs,—the purpose of which is not very apparent,—treated in Arabesque and pure line.

We now turn to Solis's third style of ornament,—the "blottesque." It is always pleasant to devise ingenious theories accounting for successive steps in the growth of any art or science; there is a theory which we must confess has always appealed to us as a very plausible one, which accounts in a simple way for the stride forward which decorative art took from the use of lines of uniform thickness to those of varying thickness and leaf-like form. The suggestion is that the step was unpremeditated, but resulted from the resemblance which strokes made with a brush full of paint bore in outline to leaf and flower forms; and that the famous honeysuckle pattern owes its origin entirely to this. Be this as it may, it must be admitted that very charming forms are obtainable from the use of the swelling curves which slight pressure on a full brush produces, and that they may be obtained in an almost endless variety. Our readers may possibly remember what we called the "quill-pen curves," which Le Blond introduced into many of his designs (figured Jan. 15). Virgil Solis made use of brush-strokes of a kindred nature to a remarkable extent, and produced a charming effect

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 5.

Fig. 7.

Fig. 6.

Fig. 8.

Fig. 9.

Fig. 4.

with them. In three plates, which we believe are well known to all students of early engravings, and of which fig. 7 is a copy of the most striking, a small surface (not much more than 2 in. by 3½ in.) is closely packed with a scroll, the leaves and flowers springing from which are composed of nothing but these irregular and ever-varying brush-strokes. The main lines of the scroll are themselves exceedingly graceful and well balanced, but the undoubted charm of the design lies in the vigour and dash with which these strokes are drawn, concealing the art with which they are devised, and giving a general appearance of want of premeditation to the whole. In fig. 8 are three other little scraps, which we have selected as noteworthy examples of the same style from another series of Solis's designs.

In fig. 9, we have also sketched three designs, which are even still more worthy of the name "blottesque," by Pierre Floetner, who flourished about the middle of the sixteenth century.

MACHINERY AT THE MANCHESTER EXHIBITION.

MANCHESTER, as the head of one of the great centres of English engineering industry, has well exemplified its position by bringing together what may be fairly termed a really splendid collection of engineering plant and machinery. At Old Trafford the visitor may see in active operation and be initiated into the mysteries of spinning, weaving, wool-washing, wood-working, printing, &c., all carried out by machines of the most improved and advanced types. Instructive and interesting as these processes are, we confine our remarks to those exhibits which are more nearly allied to the interests of our readers.

Prime Movers. — Steam is supplied to the Machinery in Motion department by a battery of ten Lancashire boilers, made by W. & J. Galloway & Sons, Knott Mill Iron Works, Manchester. Each of these boilers measures 30 ft. by 8 ft., is fitted with thirty-eight coned tubes, and is capable of supplying steam for 400 indicated horse-power. They are made of steel and designed for an ordinary working pressure of 100 lb. to the square inch. They are each arranged with a back flue, and are complete with all usual fittings. The workmanship in them appears to be of the highest order. We may add that the exhaust steam from the various engines is carried into one main chimney.

Some fine specimens of locomotives are contributed by the London and North-Western Railway Company, Lancashire and Yorkshire Railway Company; Manchester, Sheffield, and Lincolnshire Railway Company; Beyer, Peacock, & Co.; Sharp, Stewart, & Co.; and Nasmyth, Wilson, & Co.

The machinery in motion is driven by engines supplied by Messrs. Hicks, Hargreaves, & Co., of Bolton; Messrs. J. & E. Wood, of Bolton; Messrs. Adamson & Co., of Hyde; and Messrs. Musgave & Son, of Bolton.

Messrs. Hicks, Hargreaves, & Co.'s engine is a horizontal trunk engine of the Corliss type, and is a fine specimen of its class. The cylinder is 18 in. diameter by 4 ft. stroke. The valve gear used is a modification of the ordinary Corliss gear (Inglis's patent), and is fitted with double wrist plates, which control the steam and exhaust valves independently. The crank shaft bearings are made adjustable for wear horizontally and vertically. The engine is complete with high-speed and supplemental governor gear, and a Moscrop recorder is attached. Power is transmitted by rope gear from a driving pulley 20 ft. diameter, which acts also as a fly-wheel. For starting a small steam-barring engine is used,—this gears into teeth formed on the inside periphery of the driving-wheel, and is arranged to fall in and out of gear automatically.

Messrs. J. & E. Wood's engine is a high-pressure horizontal cylinder, 25 in. diameter by 5 ft. stroke. It is fitted with Corliss valve gear and quick-speed governor. The power in this case is transmitted by a rope pulley of 24 ft. diameter, grooved for fifteen ropes.

Messrs. Adamson's exhibit consists of a pair of coupled compound horizontal condensing engines, with 16 in. and 28 in. cylinders and 3 ft. stroke, to give off 200-h.p. These engines are of the trunk-girder type and fitted with the Wheelock patent automatic cut-off gear, which is of very simple construction and appeared sensitive and efficient in action. Both the high and low pressure cylinders are fitted with circular steam valves arranged with a reciprocating movement. A condenser and air-pump worked by oscillating gear are fitted, but are not in work. All the valves are placed below the cylinders, thus enabling any water arising from condensation to be readily got rid of. With the object, we presume, of reducing the friction of working, the cut-off valve is made concave on the face, with a double opening.

Messrs. Musgrave & Sons (Limited) show a strongly-designed pair of horizontal compound engines mounted on box framing. The high-pressure cylinder is fitted with a modification of the Corliss valve gear, and an automatic trip-gear is also fitted; a condenser is attached. These engines are started by one of Musgrave's patent barring engines, and must be pronounced fine examples of their type.

Messrs. Mather & Platt, of Salford, supply a pair of inverted cylinder engines, for driving part of the electric light installation. The cylinders are 20 in. diameter by 30 in. stroke, and two heavy fly-wheels are used. A convenient and somewhat novel form of automatic expansion valve gear is fitted. The dynamos are driven direct by means of leather chain belting made of double concave section to suit the convexity of the driving wheels. We noticed that these engines were driving at very short centres: the reason for this we are at a loss to conceive, as the slip and wear on the belt and bearings are thus considerably aggravated. The workmanship in these engines is everything that can be desired. Adjoining these engines is a pair of vertical high-speed compound engines, by Messrs. Davy, Paxman, & Co., of Colchester, of similar construction to those exhibited by the same firm at the recent Colonial Exhibition. Engines by Messrs. Robey & Co. and Messrs. Hornsby & Sons (Lim.), are also exhibited.

Seven Brush dynamos are driven by a fine pair of compound engines, constructed by Messrs. W. & J. Yates, of Blackburn, cylinders 14-in. and 25-in. diameter. The crank shaft, piston-rod, pins, &c., are constructed of Whitworth's compressed steel. A supplementary governor is fitted, arranged so that, in case of break-down or racing, steam is immediately shut off by means of an equilibrium valve.

Messrs. Ruston, Proctor, & Co., of Lincoln, drive some of the electric lighting plant with a highly-finished 14-in. and 24-in. compound engine. This is mounted on substantial box framing, in favour of which much is to be said, although some makers have abandoned it in favour of the girder type of frame. An extremely neat form of expansion gear, controlled by a high-speed Porter governor, is fitted. The valves are made treble ported, and the length of the steam passages has been reduced as much as possible. The feed-pump is worked by a separate eccentric. A condenser is fitted, but is not in use. The crank shaft bearings are made in three pieces, and are adjustable for wear in each direction.

An air-compressing and blowing engine is shown by Messrs. Walker Bros., Wigan. This is adapted for transmitting power in the form of compressed air in mines, tunnels, driving rock-drills, &c.; it is also used for compressing ether and ammonia for freezing purposes. The air is compressed by the action of a piston in an air cylinder, alternately drawing in the free air through valves, and expelling it afterwards through other valves, until by accumulation the air attains the desired pressure. The design and workmanship of this engine is very satisfactory.

Some specimens of vertical engines are exhibited by Messrs. Browett, Lindley, & Co., of Salford. They are of the simplest possible construction; the main frame is cast in one piece, and the slide bars are bored out true with the cylinder. The connecting-rod is made somewhat longer than usual for this class of engine, five times the crank. We noticed all the bearings were of anti-friction metal, a somewhat fresh departure for English-made engines, and one we do not altogether approve. The friction in using white metal may be somewhat less than with gun-metal, and also the first cost, but, unless the bearings are very carefully renewed, they often give much trouble and the shaft gets out of line.

Lindley's Patent Frictional Driving Gear for Dynamos is also shown. In this arrangement the engine and dynamo are placed on a bed-plate side by side. The crank-shaft of the engine passes through the dynamo frame, and the face of the fly-wheel is used to drive a friction pulley on the dynamo shaft. The dynamo can readily be thrown out of gear, and for limited space and moderate powers this combination should prove useful.

A simple form of horizontal high-pressure compound engine is shown by Messrs. Westray, Copeland, & Co., Barrow-in-Furness. The apparent object in designing this engine was to reduce the cost of manufacture to as low a point as possible. Both the high and low pressure pistons are worked by one valve, and the piston-rods are coupled on to one cross-head, consequently only one connecting-rod is needed. The feed-pump is worked by the same eccentric and rod as the valve,—an awkward arrangement, to say the least, in case of a breakdown. The engine is mounted on a cast-iron foundation, which forms a water-tank. The workmanship displayed is satisfactory.

Gas-engines are well represented by the exhibits of Messrs. Crossley Bros., Messrs. Andrew & Co., Messrs. Dempster & Co., and Messrs. Wallworth & Co.

Messrs. Crossley Bros. exhibit, amongst other things, one of their 4-h.p. horizontal engines combined with a Crompton dynamo. The dynamo is mounted on the cylinder, and driven by a link leather belt from the fly-wheel. The arrangement is compact, but it necessitates the use of a short driving-belt, and the use of a jockey pulley to prevent undue slipping. A sensitive form of pendulum governor, especially adapted to the requirements of electric lighting, is fitted to this engine. A 7-h.p. engine, combined with force-pumps, and a 4-h.p. engine, with Lightfoot's patent dry-air refrigerator, are amongst the other exhibits.

Messrs. Andrew & Co., Limited, show one of their "Stockport" horizontal gas-engines in motion; and "Elland" gas-engines (Campbell's patent) are shown by Messrs. Dempster & Sons.

Messrs. Henry Wallworth & Co., of Manchester, exhibit Sturgeon's patent gas engine. It is claimed for this engine that the mixed charge of gas and air being ignited, its expansive force is received equally and simultaneously on two pistons. Each of these pistons moves up and down in a vertical cylinder, and imparts independently force to one pair of cranks on a double-crank shaft, to which it is connected by a sway-beam and connecting-rod. One impulse is given in every revolution of the crank shaft, and the working parts are balanced. The expansion of the charge is carried down almost to atmospheric pressure before the exhaust-pipe is opened.

In the grounds one of Spiel's patent petroleum engines is shown at work by Messrs. Shirlaw & Co., Birmingham. In this engine small charges of petroleum in its fluid state are used instead of steam or gas, the charge is ignited through the medium of a spirit-lamp and igniting-valve placed at the back of the cylinder. The petroleum is kept in a tank and drawn to a reservoir on the engine by means of a small centrifugal pump. The governor gear appeared to have the engine well under control, and the running was uniform. As coal or gas are dispensed with, this engine under certain conditions should prove itself useful.

Woodworking Machinery is represented by Messrs. Thomas Robinson & Son, of Rochdale, and Messrs. Pickles & Son, of Hebden Bridge. Messrs. Robinson exhibit some ten machines, which include a centre-feed four-cutter planing and moulding machine. The main frame of this machine is cast in one piece, and the wood is fed through the machine by four feed rollers,—two plain and two fluted,—all of which are geared to prevent slipping. The bottom rollers are adjustable for wear, which is an improvement over the old plan of mounting them in fixed bushes. The top feed rollers are carried on swings hinged from a centre, and are readily raised or lowered by means of a hand-wheel to suit different thicknesses of wood.

The side-cutter spindles are mounted between the top and bottom cutter-blocks, which is preferable to placing them at the end of the machine, as is sometimes done. For working large mouldings, the top cutter-block is arranged to angle, so that the cutters working the thin part of the moulding need not project further from the block than the others, and it is less likely to be damaged. Altogether this is a compact and well-designed machine, but we notice that the countershaft is attached directly on to the machine; this may pass for small machines, but is distinctly objectionable on

large ones, as the belts have to run at short centres, which means more rapid deterioration of both belts and bearings.

A somewhat new combination in the shape of a combined hand-feed planer and moulder is also shown here. This consists briefly of an ordinary surface-planer with the cutter-block spindle extended, and carrying an extra cutter-block for moulding at its outer end. An additional rising and falling table is fitted, and so arranged that the extra block can be worked either above the table,—the wood being fed under it for straight moulding, thicknessing, &c.,—or below the table,—the wood being fed over it for tonguing, grooving, &c. A fence and pressure spring for guiding and holding the wood are fitted. The outer end of the cutter-block spindle can also be arranged for carrying boring tools.

A sample of Armstrong's well-known patent machine adapted for cutting ordinary dovetails, angle dovetails, and blind dovetails, especially adapted for the requirements of box and packing-case makers, is also shown here. Amongst the other exhibits is a continuous feed circular saw-bench, a combined hand and power feed planing-machine, a tenoning-machine, steam mortising-machine, and band saw. The wood is fed through the saw-bench by means of fluted rollers mounted vertically on a spindle carried at the end of an adjustable radial arm. The radial arm swings on a pillar bracket in the front of the machine, and can be adjusted to suit saws of varying diameter. The front of the fence is fitted with friction rollers, and the bench can be used either for deeping or flatting as may be required.

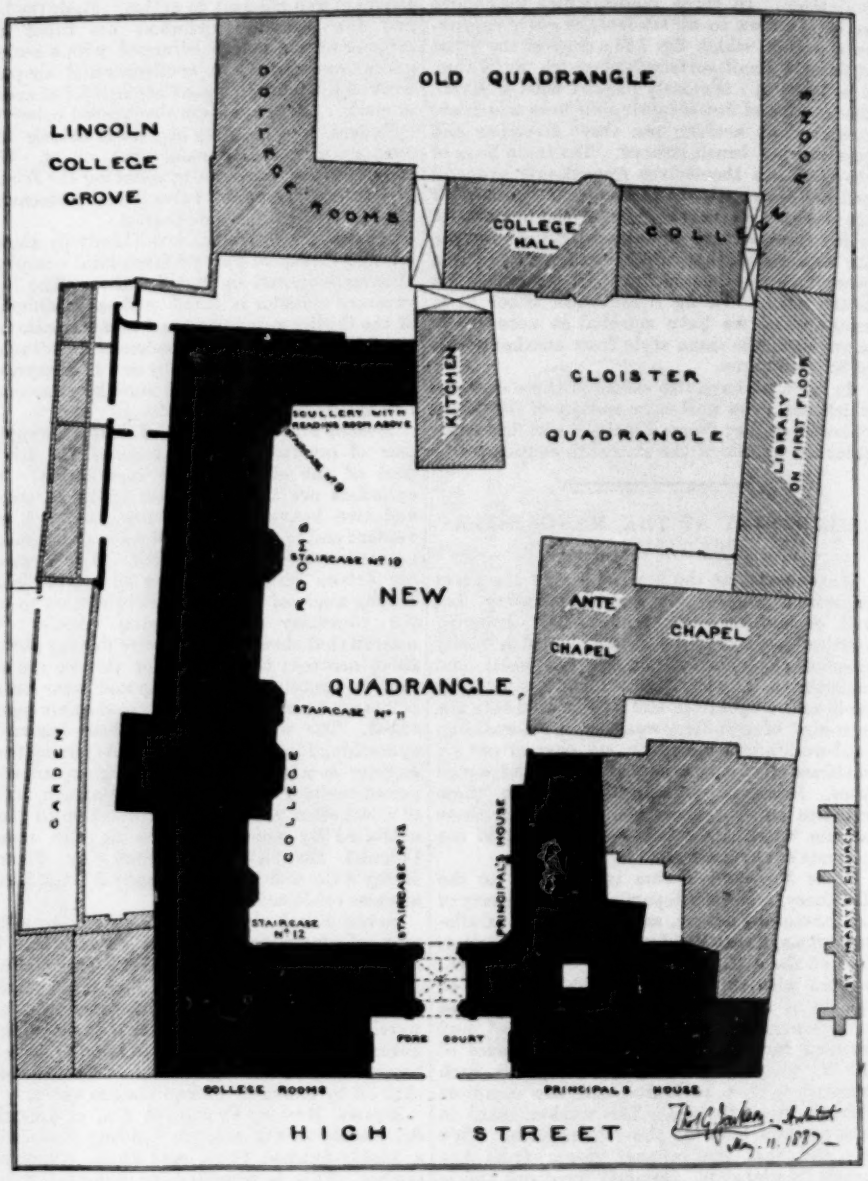
Amongst other machines Messrs. Pickles & Son exhibit one for planing and thicknessing, fitted with Rawling's spiral cutters. For working curly or cross-grained woods these cutters possess advantages, as they give a gradual shearing cut to the wood instead of a more or less chopping cut, as given by ordinary straight cutters. The cutter-block is of spiral form and the steel cutters are screwed to it. The use of these cutters necessitates the employment of a special grinding apparatus to make them perfectly true on the cutting edge. The wood is fed through the machine by means of geared rollers in the usual way. The main frame is cast in one piece and is arranged with an extended base. An ordinary hand-feed surfacing and jointing machine fitted with these cutters is also shown, and a self-feeding cutter grinding machine for grinding long plane-irons to one exact bevel. This consists briefly of a horizonal spindle carrying a cylinder or cup emery wheel. The iron to be sharpened is bolted on to an adjustable face-plate mounted on a slide arranged with a horizontal traverse past the edges of the emery wheel. Adjustable stops regulate the traverse of the slide carrying the iron and reverse a rack and pinion motion till the right amount of bevel is produced on the iron, when it stops grinding. For planing very wide pieces, and to do clean and accurate work, a machine of this class is almost a necessity.

A combined continuous and drag feed circular saw-bench has one or two fresh features, the drag feed and continuous feed being driven from the same motion. The continuous-feed roller is readily adjustable to different sizes of saws or thicknesses of wood, and can be easily removed when it is required to use the drag feed. A useful form of saw-guard is fitted on one of the saw-benches, the guard is of hollow section to cover the top of the saw. It is hinged to a horizontal stud, arranged to adjust vertically by means of a hand wheel and screw. The guard may be swung back out of the way to allow of the saw being sharpened, and it is so placed at the back end of the bench that it does not interfere with cross-cutting.

Brick and Tile Making Machinery is represented by Mr. Wm. Johnson, of Leeds, and Mr. Thomas Fawcett, of Leeds. Amongst other things Mr. Johnson shows one of Kennedy's semi-dry brick, tile, cement, and concrete block making machines. This machine presents several features of interest, and its operation may be briefly described as follows:—The clay to be formed into bricks is fed into a hopper, in either a semi-dry or semi-plastic state, and is received by a bottomless box or charger, which works in a slide on the face of the table and over the face of moulds formed in the table. The moulds are thus filled, and to ensure a dense feed a pressing-head drops on the moulds, the pressing-head is then raised to allow the charger to return again under the hopper to be refilled, and in its passage it strikes off the surplus clay level with the top of the moulds. The pressing head then drops a second time, and two distinct additional pressures are given to the clay or brick. The presser then leaves the moulds, and the bricks are raised for delivery. A regulating apparatus is fitted, by which the thickness of the brick may be varied as required whilst the machine is running. The pressing plates and moulds are heated by steam, and require no further lubrication.

Four distinct pressures are given by this machine, and the bricks produced are of good form and very dense. For working difficult materials, it should be particularly useful. Hand lever brick and tile pressing and other machines are also shown here.

Amongst Mr. Thomas Fawcett's collection of brickmaking machinery, we noticed a very workmanlike duplex lever hand-power brick and tile press. In this press the pressure is obtained by means of double levers working from a crank shaft with a fly-wheel on, and it is claimed that a leverage of 5 to 1 over the ordinary lever or crank press is thus obtained. The brick, when pressed, is lifted out of the mould automatically at the same time the bottom plate is dropped down ready for the next brick. Mr. Fawcett also makes a wrought-iron perforated bottom clay grinding-pan, especially adapted for grinding shale, blind, marl, &c. It is driven from below, and is fitted with an arrangement for taking the weight of the rollers off the pan when not grinding.



Plan of New Buildings, Brasenose College, Oxford.

Penzance.—A new Rechabite Hall has lately been opened here. Besides the large hall, which will seat 700 persons, there is a smaller hall. The building is chiefly built of granite. Mr. J. W. Trounson is the architect.

Illustrations.

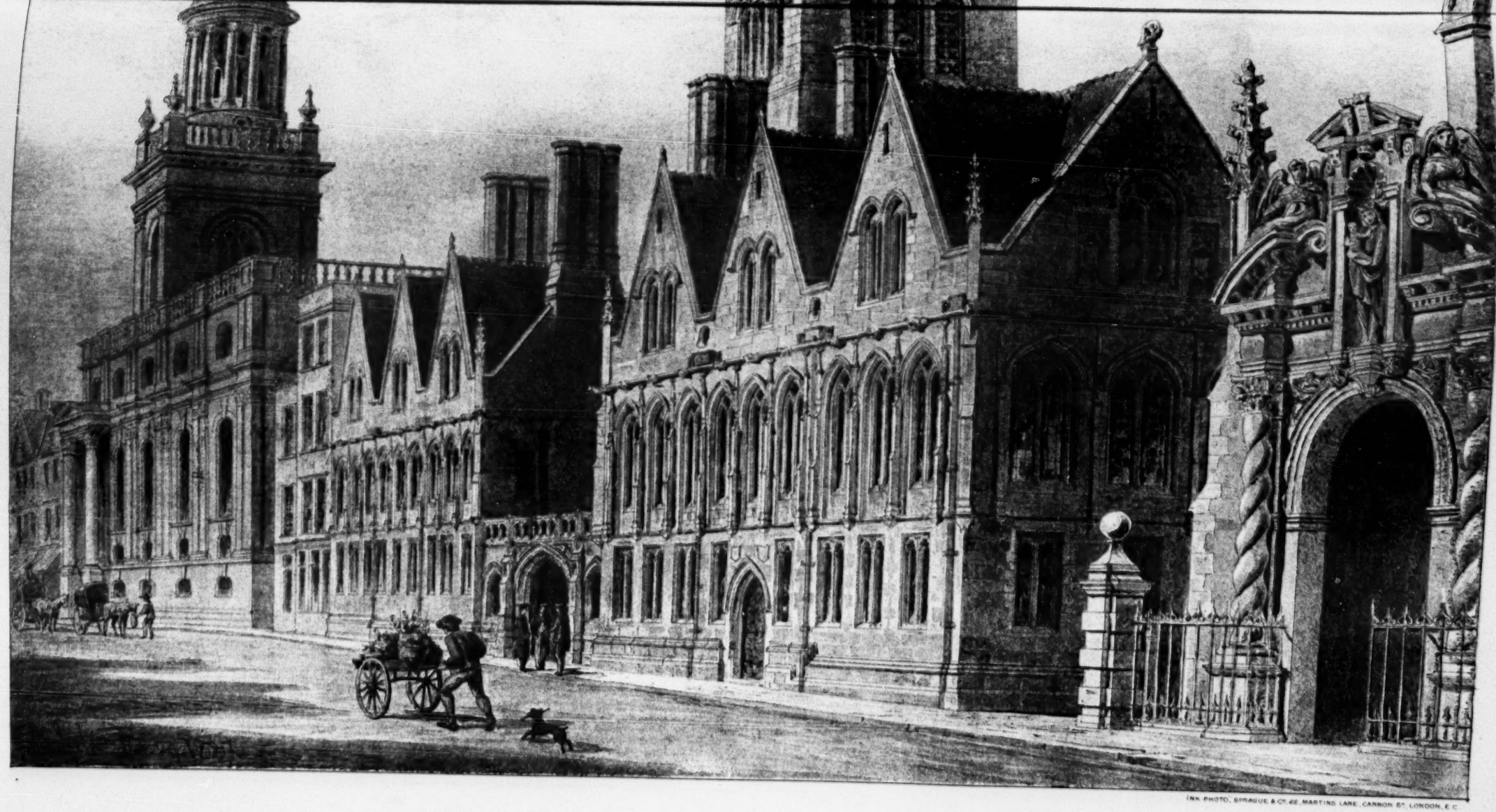
BRASENOSE COLLEGE, OXFORD.

THE new quadrangle which is being built from Mr. Jackson's designs, at Brasenose College, Oxford, has been formed by the removal of several cottages in Amsterdam-court (whose name has preserved the memory of an ancient University hall which has long disappeared), and some buildings of timber and plaster of no antiquity, which contained rooms for undergraduates.

The wing which forms the west side of the new quadrangle was begun in 1882, and has just been completed, together with the return wing on the north. These buildings contain twenty-two sets of rooms for undergraduates, one large set for a Fellow, and two large lecture-rooms, as well as a reading-room for undergraduates, and some additional offices connected with the college kitchen.

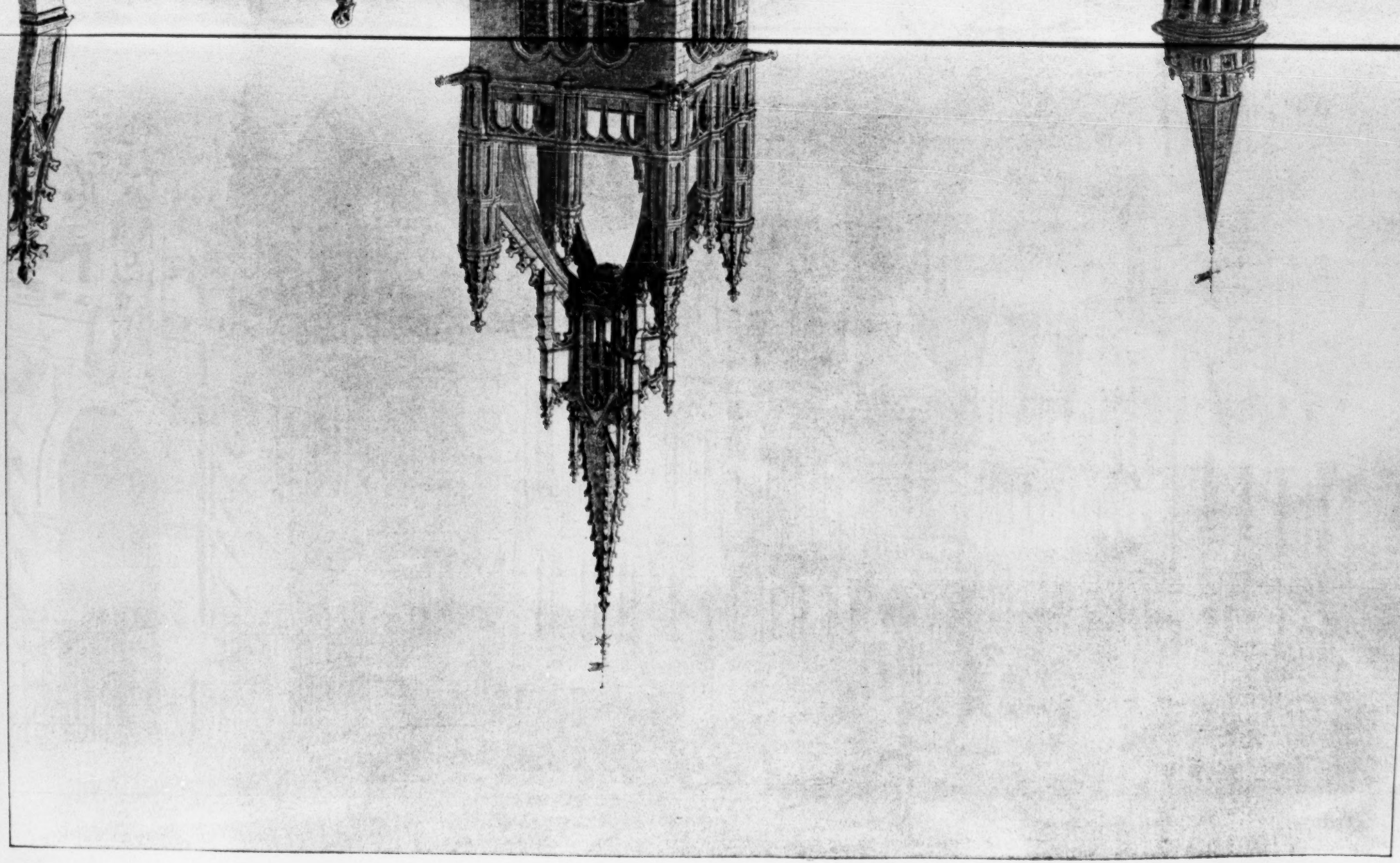
It is now proposed to complete the quadrangle by a south wing, with a frontage to High-street, extending westward from the corner next St. Mary's Church, with a gateway and entrance-tower in the middle. In order to place this tower so as to group well with the steeples of St. Mary's and All Saints' churches, which form the principal features of the well-known view of the High-street of Oxford, the new tower is set back from the street frontage, as the block plan will explain, so that a small forecourt will intervene between it and the street, enclosed at the sides by the other parts of the new building.

The introduction of a third important object into so famous a picture is naturally a difficult matter, and one that requires grave consideration. A square tower, such as is usual over collegiate gateways, would be discordant with the two steeples between which it would appear, while a steeple would be too ecclesiastical in



(INK PHOTO, SPRAGUE & Cº 62, MARTINS LANE, CANNON ST, LONDON, E.C.

NEW BUILDINGS, BRASENOSE COLLEGE, OXFORD.—Mr. T. G. Jackson, Architect.



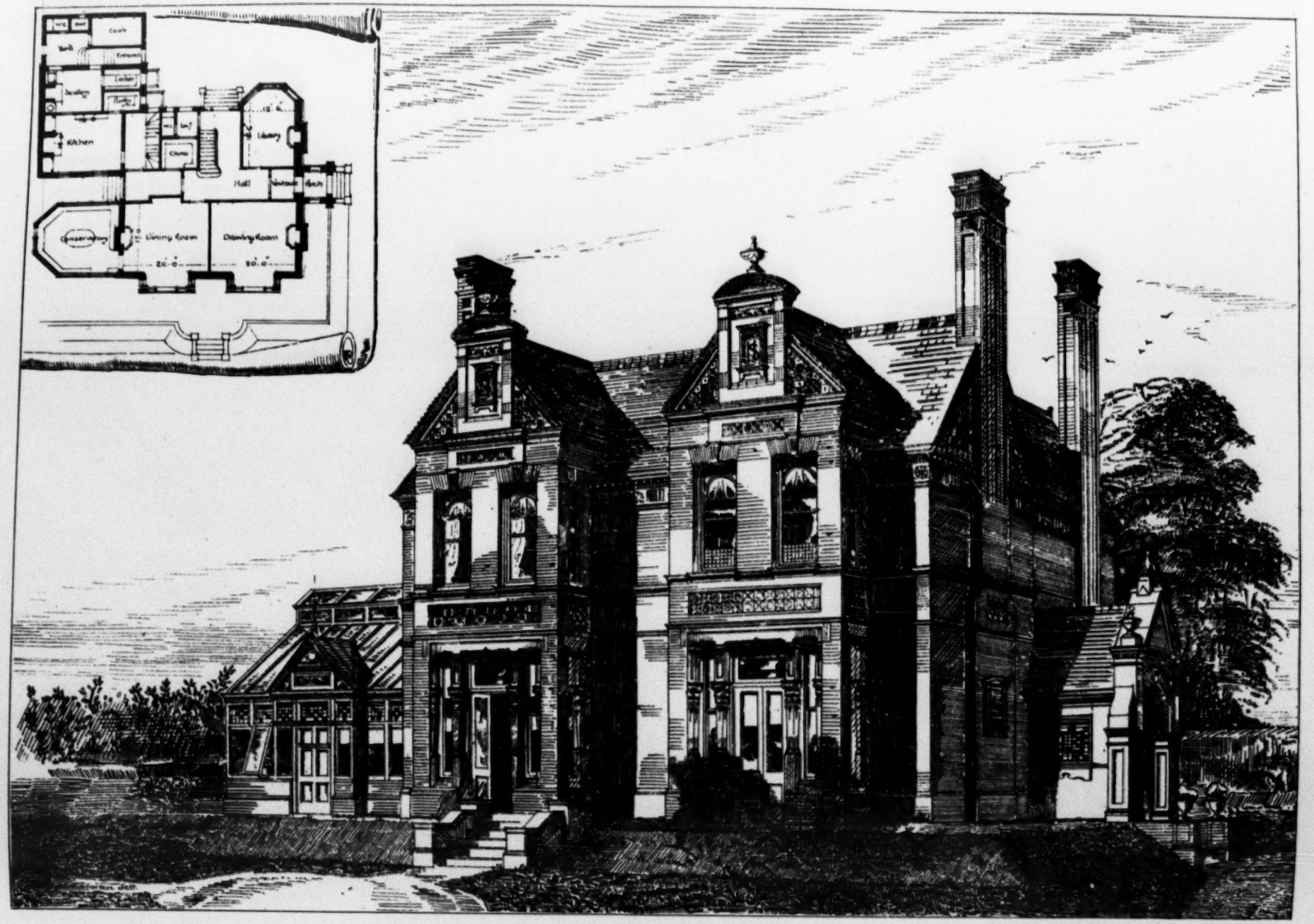


PHOTO-LITHO. SPRAGUE & Co. 22, MARTINS LANE, CANNON ST., LONDON, E.C.

HOUSE AT GRIMSBY.—Mr. Charles Bell, F.R.I.B.A., Architect.

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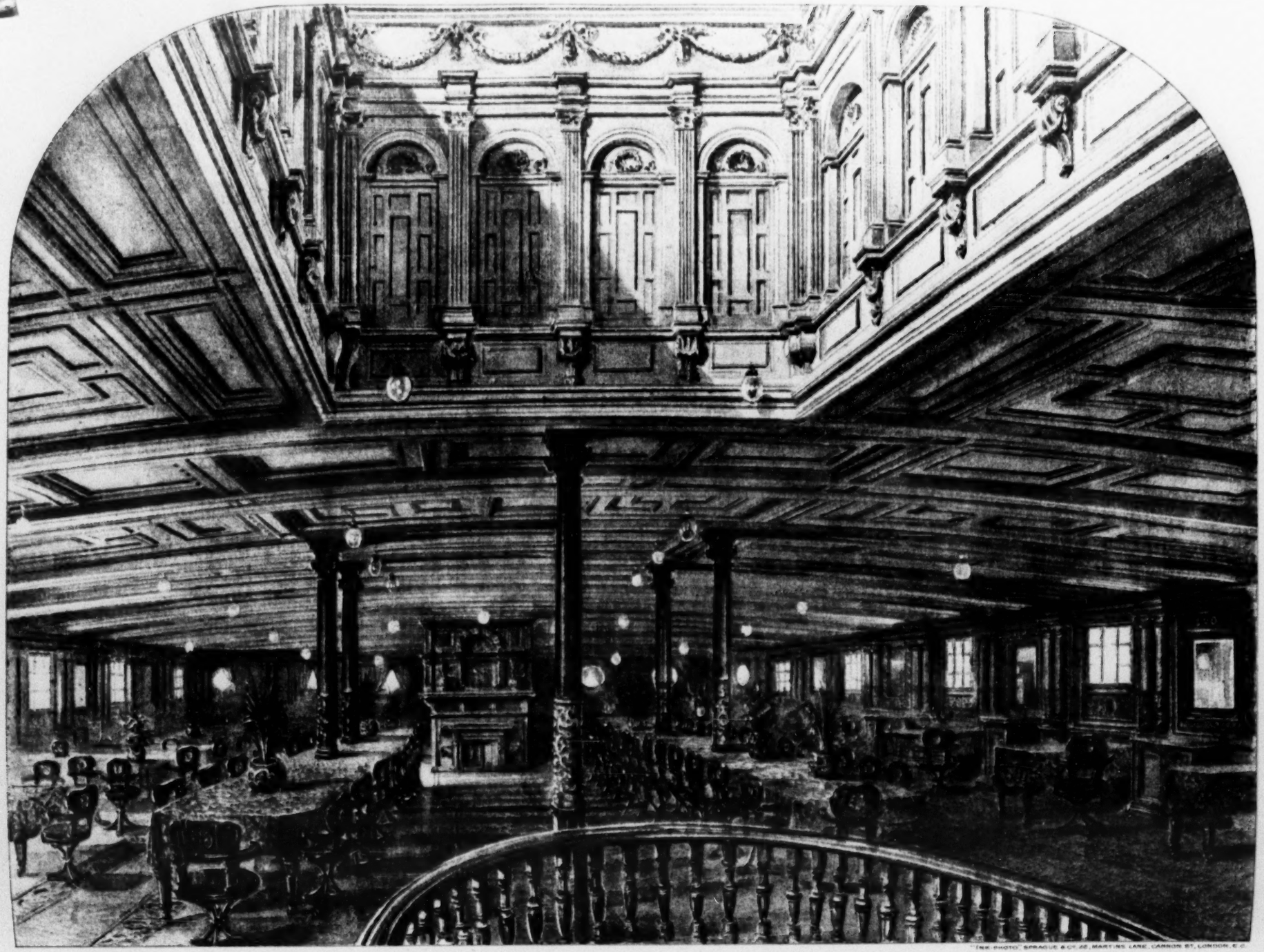

DINING ROOM, ROYAL MAIL STEAMER "ORMUZ."—DESIGNED BY MR. J. J. STEVENSON, F.R.I.B.A.

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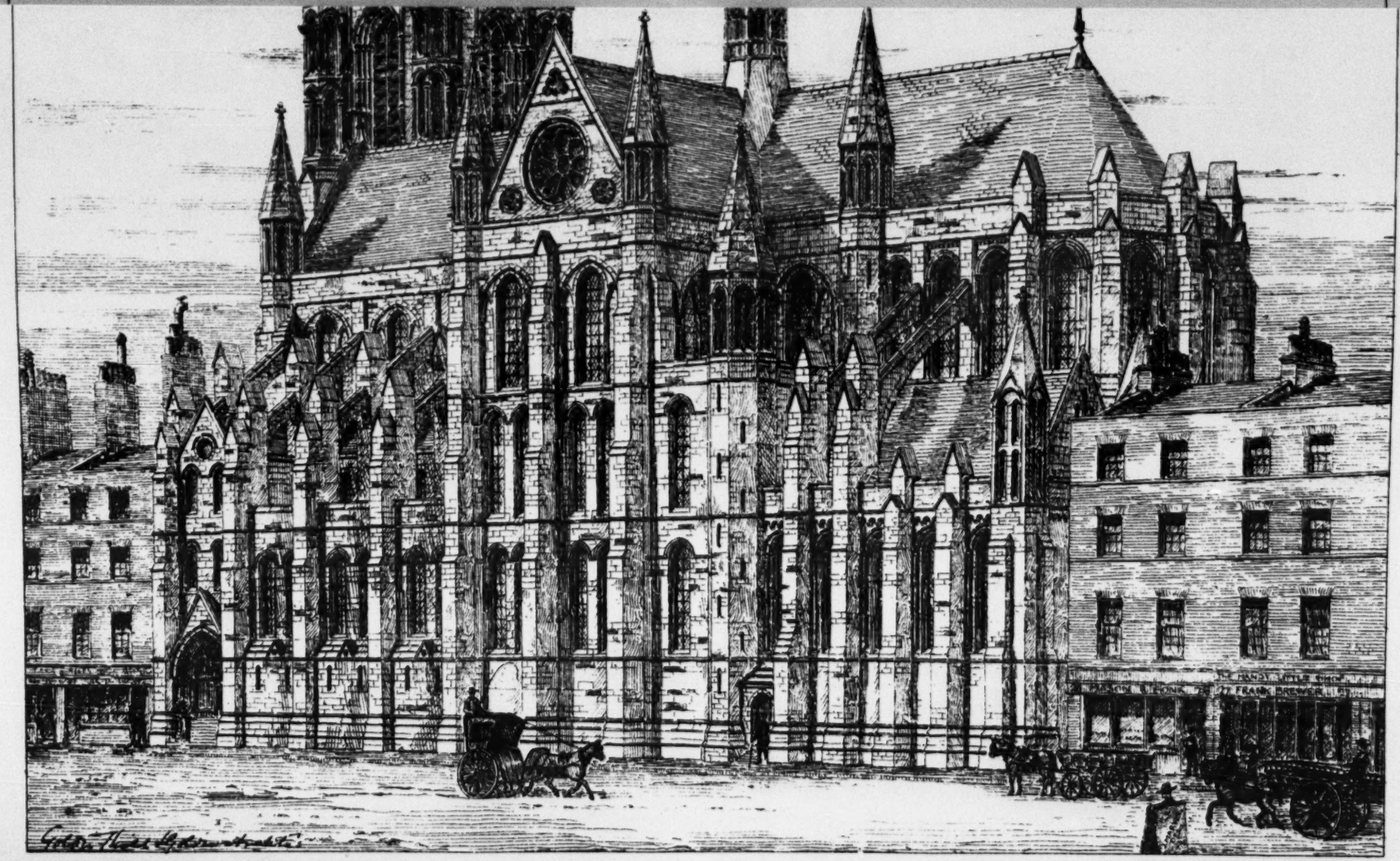
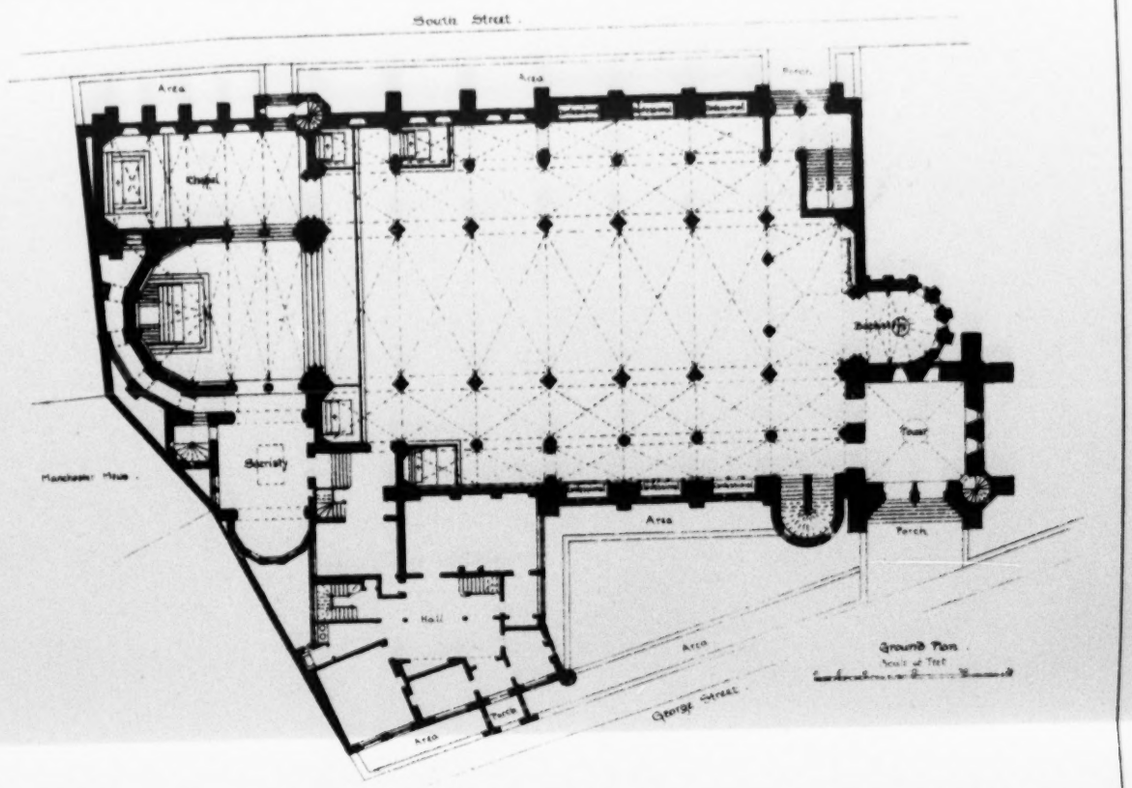
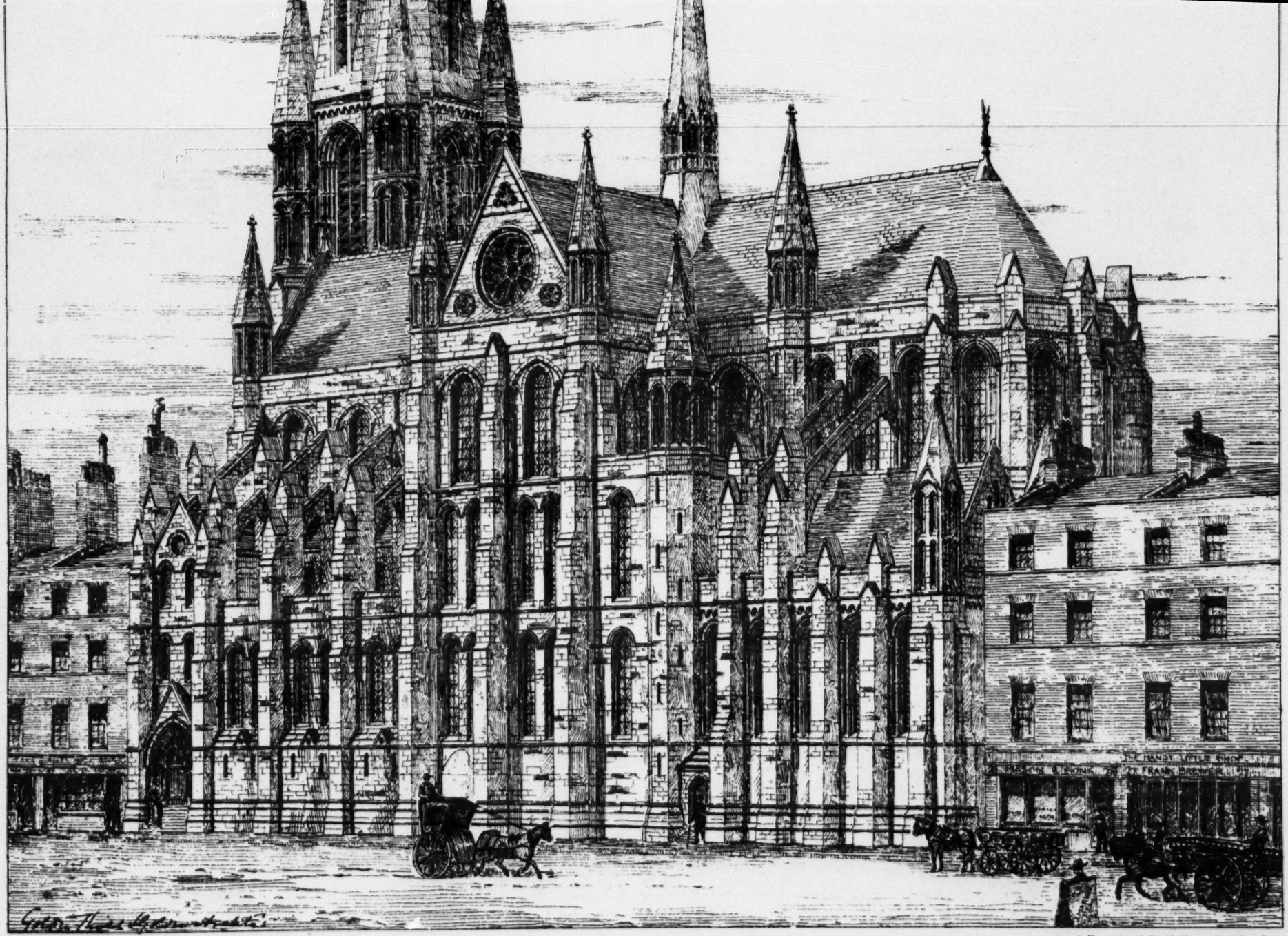


CHURCH OF ST. JAMES, SPANISH PLACE, REVISED DESIGN.—MESSRS. GOLDIE, CHILD AND GOLDIE, ARCHITECTS.


South Street.
Area
Area
Chapel
Vestry
Manchester House
Area
Porch
Hall
Area
Porch
George Street
Ground Plan
Scale of Feet



F. Kell photolith & Printer

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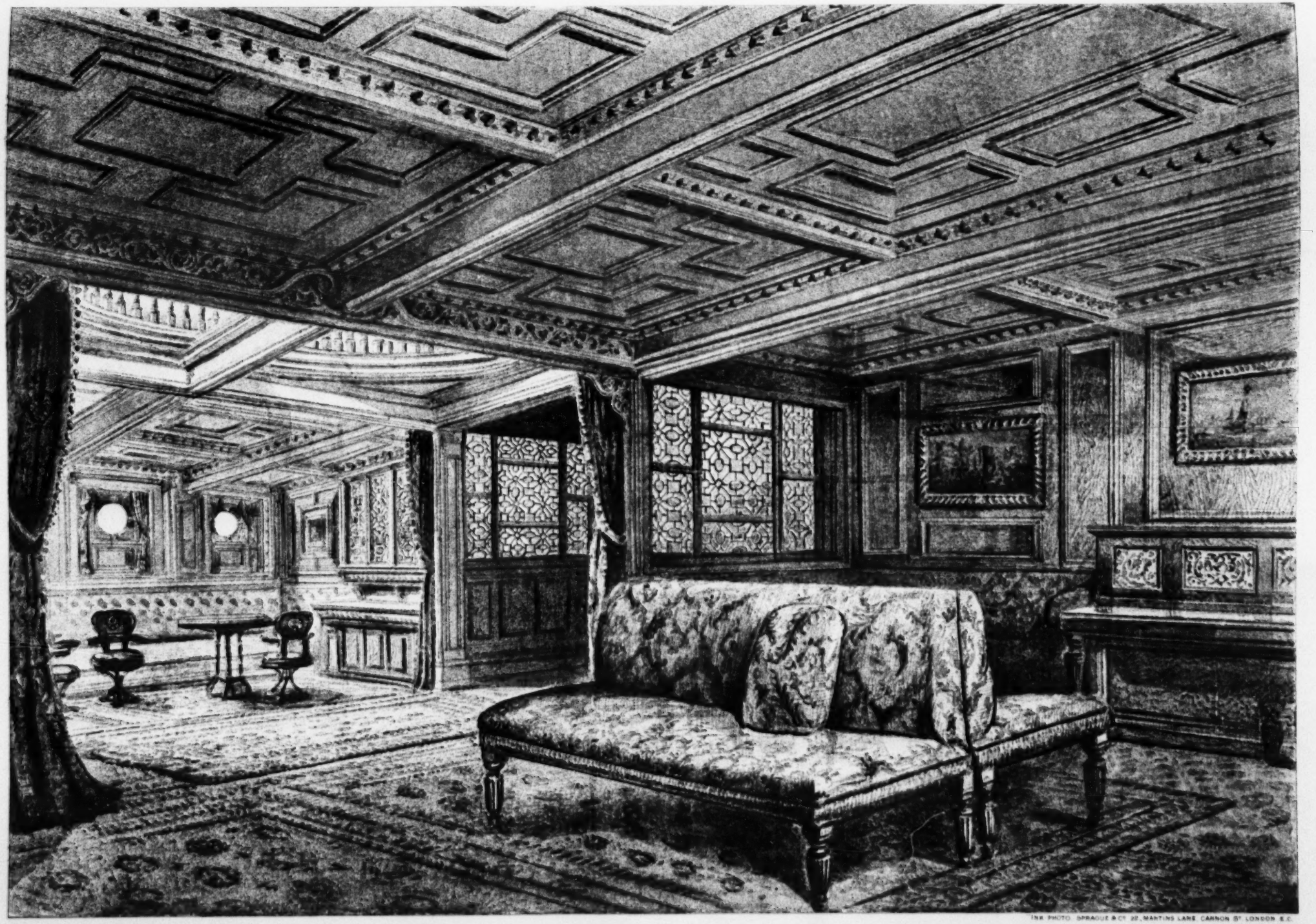
CHURCH OF ST. JAMES, SPANISH PLACE, REVISED DESIGN.—Messrs. Goldie, Child and Goldie, Architects.



DRAWING ROOM AND LIBRARY, ROYAL MAIL STEAMER "ORMUZ."—Designed by Mr. J. J. Stevenson, F.R.I.B.A.

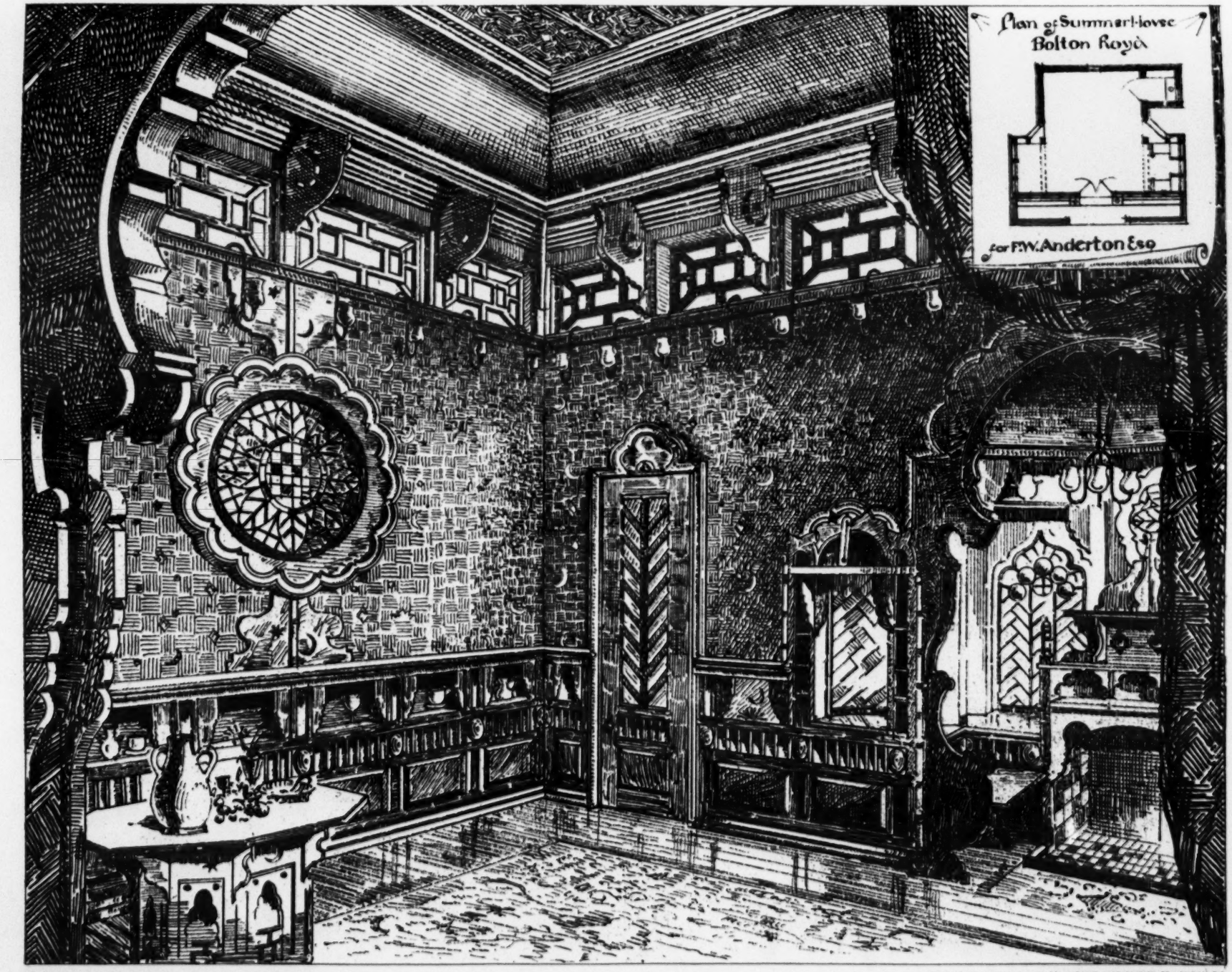


PHOTO-LITHO., SPRAGUE & CO. 82, MARTINS LANE, CANNON ST., LONDON, E.C.

SUMMER HOUSE AND SMOKING ROOM, BOLTON ROYD.—Messrs. H. & E. Marten, Architects.

character for its purpose. An open crown steeple surmounting a massive square tower was adopted by the architect as the form which would best reconcile these difficulties.

Of the two blocks of buildings fronting the street, the nearer one will contain a new house for the Principal, and the farther one rooms for undergraduates.

The drawing from which the illustration is taken is hung this year at the Royal Academy.

THE SALOONS OF THE *ORMUZ*.

WE give this week two drawings, one of the dining-saloon, the other of the drawing-room and library, of the new royal mail steamer *Ormuz*, the latest addition of the Orient Company, trading to Australia.

The Drawing-room and Library are on the main deck, beside the sleeping cabins, occupying together the breadth of the ship,—a dimension of 52 ft.; the total length of the ship being 480 ft. Their walls are lined throughout with satinwood, its rich yellow colour enhanced by gilding. In the panels of the drawing-room are pictures by Pettie, MacWhirter, Colin Hunter, Hemy, O'Connor, Wyllie, and Dudley. The furniture in this room is covered with blue Utrecht velvet from Morris's, and that of the library with dark green morocco. The floors are laid with Morris carpets. There is ample light from the reflection from the water from the white painted ceiling, and through the oval opening in the dining-room with its skylight above.

The Dining-room is placed on the upper deck, an innovation from the arrangement hitherto usual of placing it on the main deck, in the position occupied in this ship by the drawing-room and library. This avoids the necessity of going below for meals, which in rough weather prevents many passengers from taking them; while a passage outside the saloon, between its wall and the ship's side, allows the windows to be kept open in all weathers.

In the dining-room the floor is the teak deck of the ship; the walls are in Spanish mahogany, relieved by carved columns and inlay of satinwood patterns in rosewood stiles, with ebony mouldings round bevelled mirrors.

These rooms are all in the fore part of the ship, before the engines, instead of as formerly at the stern, for, since the introduction of screw-propellers, the forepart is found to be the pleasanter part of the vessel, especially in a voyage through the Red Sea and the Tropics, and is consequently devoted to the first-class passengers. On the deck above the dining-room is a second drawing-room, with a broad promenade on each side measuring an eighth of a mile round. There are thus four saloons besides the smoking-room for the first-class passengers instead of the single dining saloon devoted to their use in older ships.

The *Ormuz* has just returned from her first trip to Australia, having made the fastest passage on record by one day and nine hours, including stoppages and detention. She was built by the Fairfield Company at their works on the Clyde in nine months from receiving the order, the workmanship throughout being of the most excellent description. The fittings of the saloons were executed at Fairfield from drawings by Mr. J. J. Stevenson, architect, of London; the carving and inlay were done by Messrs. Knox and Walter Smith, of Lambeth.

R.C. CHURCH, SPANISH-PLACE.

WE give the revised design of the exterior of this church, by Messrs. Goldie, Child, & Goldie. The design has been somewhat modified since we published a view of it at the time of the competition. (See *Builder*, August 1st, 1885).

A HOUSE AT GRIMSBY.

THIS house occupies a good site in the outskirts of the town, and is built of best red local bricks with Red Mansfield stone dressings. The string-courses and gables, &c., are of the Hathern Company's bricks, as are also the balustrade and wall to the garden in front of the house. The roofs are slated.

The plan is specially made to suit the owner's requirements, and consists of drawing and dining-rooms in the front, with library in rear, a spacious hall, and staircase. There are six bed and dressing rooms. All the principal rooms have mahogany doors. The hall is marble mosaic, by De Grelle & Co., of London.

The glazing to the staircase window is of special design, introducing conventionally-treated sea fish, &c., and in the centre is a fishing smack. Mr. Alderman Smethurst, J.P., Mayor of Grimsby, the owner of the house, is one of the largest smack-owners in the town. The architect is Mr. Charles Bell, of London, and the builder is Mr. T. H. Smith, of Grimsby.

SUMMER-HOUSE AND SMOKING-ROOM, BOLTON ROYD.

THE exterior of this room is treated in Japanese character, whilst the interior is of Moorish design.

The plan shows two recesses, one for a fireplace, the other a divan; a lavatory or pantry adjoins, and arrangements are provided for serving afternoon tea or other light refreshments.

The windows in the elevation facing the lawn-tennis ground are glazed with patent plate in leaded lights, the remainder of the glazing being richly coloured.

The walls are constructed of timber and concrete on a stone base, and are covered internally above the dado with Lincrusta-Walton, and effectively decorated with Moorish symbols.

The furniture, hanging lamps, and other details were specially designed by the architects, Messrs. H. & E. Marten, of London.

NOTES FROM DENMARK AND SWEDEN.

WITH regard to the decision of the Danish Parliament, recently referred to in the *Builder*, of rebuilding the Castle of Christiansborg, the royal residence at Copenhagen, which was destroyed by fire a few years ago, and also to erecting a new House of Parliament, it now appears that the committee appointed to report on the details of these plans have recommended that the future castle shall serve both as a residence for the royal family and seat of the Assemblies. The latter are, however, to be located in a wing of the palace entirely separated from the rest. Designs will be invited for this plan, the number of premiums being seven, of 115*l.* each.

The Danish Parliament decided, in the session just closed, to devote a sum of 350,000*l.* of State funds for the purpose of pulling down certain "rookeries" in Copenhagen, and to build on their site modern dwellings for labourers and artisans. The amount will be advanced by the city authorities, in the manner they may decide, at a very low rate of interest to builders.

A little while ago the first stone was laid of the Exhibition building in Copenhagen, to be opened next year. The frontage of the main building will be about 1,000 ft., and it will be surmounted by an enormous glass cupola and four towers at the corners. There will be three entrances. This building will be devoted to home and foreign art exhibits, whilst a number of small buildings will be occupied by the various other courts. There will also be gardens, &c., as at the last exhibitions at South Kensington. It seems that the exhibition has a very good prospect of success, as a large number of applications for space has been received from abroad, as well, of course, as from Scandinavia.

During last year the chief of the Copenhagen fire brigade paid a visit to several European capitals in order to study the system of fire-extinguishing adopted in those cities, the result of which visits is that the whole fire brigade in the Danish capital is to be reformed. Thus, the numerous little fire-stations all over the city, equipped with a manual engine and some ten men, are to be replaced by one central and a few hand stations, replete with steam-engines, life-saving apparatus, &c. The wages of the men are also to be increased, and they will have the right of retiring on a pension after fifteen years' service. A complete system of telegraph and telephone service will also be established. The outlay in the new scheme will be 35,000*l.*, and the annual cost 18,000*l.*

In Sweden the restoration of the ancient cathedral of Upsala is now in full progress,—a work chiefly carried out by State aid. During the cold months only internal work could be carried on, but now the restoration of the exterior has been resumed. The architect carrying out the restoration is Herr F. Langlet.

It appears from the Stockholm journals that during the present spring the building industry in the suburbs of Stockholm has been very depressed,—in fact, it seems that the demand for small modern villa-like residences and artisans' dwellings, which gave such an impetus to the industry some years ago, has now been fully satisfied. On the other hand, speculators have turned their attention to the more central parts of the city, where so-called "eligible" sites for mansions are in great request, although difficult of obtaining. It is chiefly with the disposal of such sites that the principal estate agencies are now engaged.

The Queen of Sweden has appointed a committee for inviting and selecting a design, subject to her majesty's approval, for the new institute for the training of nurses, to be built in the celebrated Stockholm Park Djurgården, at the expense of the king and queen, the cost being estimated at 10,000*l.*

An institute, somewhat on the plan of the Imperial Institute, is to be founded in Stockholm, the President being the Crown Prince of Sweden. The object of the scheme is to develope the sale in foreign markets of articles of Swedish manufacture and industry, arrange exhibitions of the same, &c., with a central export exhibition depôt in Stockholm. Some 500 members have already joined the association.

From the latest statistics published relating to the timber industry of Sweden, we learn that at the beginning of 1886, the total area of forest land in the country was 17,150,000 hectares, and that in course of the year 1,776,000 cubic mètres of timber were felled, the price varying from 3s. 3d. to 6s. 6d. per cubic mètre. At the end of the year, the value of the State forests was estimated at 2,250,000*l.* The revenue from the same amounted to 100,000*l.*, and the expenses to 40,000*l.*

A Swedish engineer, Herr Welin, has constructed skates of glass instead of iron, which are said to have been found very suitable for their purpose.

THE LATE SIR HORACE JONES.

AT the meeting of the Court of Common Council, on the 26th ult., the Town Clerk having read a letter announcing the death of Sir Horace,

Mr. Hicks, Chairman of the City Lands Committee, said he was quite certain that every member of the Court would receive the intimation of the City Architect's death with the deepest sympathy and respect (hear, hear). It was about twenty-three years since the then Mr. Horace Jones entered the service of the Corporation. He had been one of the high officers, and a more honest and faithful officer had never served the Corporation (hear, hear). He would content himself by saying that a large portion of the genius of Sir Horace Jones was written in stone in the City of London (hear, hear). He moved,—

"That this Court has heard with sincere regret of the death of Sir Horace Jones, City Architect, and desires to offer its condolences to the widow and family on the irreparable loss they have sustained, and further to place on record its high appreciation of his ability as an architect, and of the faithfulness and integrity with which he always discharged the duties of his office."

Alderman Sir F. W. Truscott seconded the motion, which was agreed to in silence. The resolution was ordered to be signed by the Town Clerk and sent to the family.

Mr. Hicks subsequently moved "That it be referred to the Officers and Clerks' Committee to consider the nature, duties, and emoluments of the office, reporting thereon to the Court." He said he did this entirely on his own responsibility, because he felt there was a somewhat general feeling in the Court that the Committee should consider whether it would be more satisfactory to appoint a Surveyor rather than a City Architect (hear, hear).

Mr. Shaw seconded the motion, which was agreed to.

Mr. Hicks moved that Mr. Murray, the Principal Clerk in the Architect's Office, be authorised to carry on the duties of the office till the further orders of the Court. This was also agreed to *nem. con.*

The funeral took place on Friday, the 27th ult., at Norwood Cemetery, where the interment took place in the family vault. The *cortège* (consisting of a four-horse hearse and seven pair-horse mourning coaches, besides a number of private carriages) left the residence of the deceased, 30, Devonshire-place, W., about ten o'clock, and arrived at Norwood Cemetery shortly before half-past eleven. The burial service was read by the Rev. J. Hawes, (vicar of St. Paul's, Mill Hill, Hendon) and the Rev. Henry Patch (rector of Winchelsea, Sussex), brother-in-law of the deceased. The outer coffin, which consisted of polished oak, bore upon a knight's shield brass plate the following inscription:—"Sir Horace Jones, Knight, born May 20th, 1819. Died May 21st, 1887."

Among the chief mourners were Lady Jones (widow of the deceased), Mrs. Billing, Miss Wallick, Mr. Octavius Hansard, F.R.I.B.A., Sir J. B. Monckton (Town Clerk), Mr. H. H. Crawford (City Solicitor), Mr. G. P. Goldney (City Remembrancer), Mr. A. J. Brand (City Comptroller), Mr. Roderick (Secondary), Mr. W. Payne (City Chamberlain's Office), Col. Haywood (Engineer to the Commissioners of Sewers), Sir Charles Hutton Gregory, K.C.M.G., Mr. John Wolfe Barry, Hon. Associate R.I.B.A., Engineer of Tower Bridge; Mr. H. M. Brunel, Hon. Associate R.I.B.A.; Mr. James Patch, Mr. A. Great-Rex (medical attendant), Mr. E. H. Burmell, F.R.I.B.A.; Mr. A. H. Ewer, Mr. R. W. Edis, F.R.I.B.A.; and Mr. W. W. Ouless, R.A.

The following gentlemen attended from the City Architect's Office, viz.: Mr. Andrew Murray, A.R.I.B.A. (Principal), Mr. Thomas Baker, Mr. A. L. Gosling, Mr. F. H. Williams, Mr. G. D. Stevenson, Mr. J. Pybus, Mr. J. Hambling, Mr. P. Rees, Mr. J. Ellwood, Mr. G. Jackson, and Mr. W. J. Liberty.

There were also present at the grave the following representatives of the Royal Institute of British Architects, viz., Mr. E. l'Anson (President), Mr. Ewan Christian (Past-President), Mr. Chas. Barry, F.S.A. (Past President), Mr. G. Aitchison, A.R.A., Mr. Alexander Graham, Mr. Arthur Cates, Mr. James Brooks, Mr. Henry Currey, and Mr. E. A. Gruning, Mr. Octavius Hansard, Mr. R. W. Edis, Professor T. Hayter Lewis, F.S.A. (Past Vice-President), Professor T. Roger Smith, Mr. Robert W. Mylne, F.R.S., Mr. Harry Oliver, Mr. Wyatt Papworth, Mr. John Norton, Mr. J. J. Stevenson, F.S.A., Mr. J. G. Turner, Mr. Andrew Oliver, Mr. Thomas Wells, Mr. C. E. Barry, Mr. W. E. Clifton (representing his father, Mr. E. A. Clifton), Mr. Thomas Henry Wyatt (Hon. Associate), Mr. W. H. Atkin Berry, Mr. F. T. Reade, A.M.I.C.E. (Hon. Associate), Mr. Pearson, jun., Mr. Charles Fowler, Mr. Thomas H. Watson, Mr. Henry Stock, Mr. H. H. Collins, and Mr. W. H. White (Secretary). Mr. Waterhouse, R.A. (who was on the Continent), Mr. J. Macvicar Anderson, Hon. Sec. (who was in Scotland), and Mr. C. L. Eastlake, Keeper of the National Gallery, and formerly Secretary, R.I.B.A., were unavoidably absent from the funeral.

The following gentlemen attended from the "Jerusalem Lodge" (197) of Freemasons, of which Lodge the late City Architect was a P.M. (having served that office in 1869; he was initiated in 1864), and treasurer at the time of his decease, viz., Mr. R. F. Grantham (Hon. Associate R.I.B.A.), G.S. (Worshipful Master); Mr. G. L. Eyles (Senior Warden); Mr. C. E. Hollingsworth, P.G.S.; Mr. E. Letchworth, P.G.D.; and Mr. T. G. Bullen (Secretary).

From the Turners' Company, of which the deceased was a member, there were present Dr. R. Turtle Piggott, D.C.L. (Master), Mr. John Jones (Past-Master), Mr. E. Sydney (Past-Master), Mr. Brackstone Baker (Past-Master), Mr. R. Loveland (Past-Master), and Mr. W. M. Shirreff (Clerk). The Upper Warden, W. L. A. B. Burdett-Coutts, M.P., sent the regrets of Lady Burdett-Coutts.

There were also present at the grave Mr. Edward Woods, President of the Institution of Civil Engineers (Hon. Associate R.I.B.A.); Mr. Frederick Dadswell, C.C.; Mr. G. E. Wood, C.C.; Mr. P. de Lande Long, Mr. W. Miller (clerk of works), Mr. T. Arnold, Mr. W. P. Padmore, Mr. C. Thwaites, Mr. John Mowlem Burt (Mowlem & Co.), Mr. C. H. Mabey (sculptor), Mr. Keevill, Mr. W. Read, Mr. Mills, Mr. H. Baily, Mr. F. Farwell, Mr. R. G. Glover (War Office), Col. Charles Harding, and Mr. G. de Maid.

Among the carriages which followed was that of Mr. Ex-Sheriff George Burt. Among the wreaths sent may be mentioned those from the Lord Mayor (Sir R. Hanson, Bart.), Lady Monckton, Mr. and Mrs. A. Murray, Mr. T. Baker, Mr. H. Oliver, the Staff of the City Architect's Office, the Officers of the Corporation, and the members of the Jerusalem Lodge. In all about 150 persons were present at the cemetery.

We may add that a portrait of the deceased, by Mr. W. W. Ouless, R.A., is exhibited in this year's Royal Academy Exhibition.

BUILDERS' BENEVOLENT INSTITUTION.

ELECTION OF PENSIONERS.

AN election of three pensioners on the funds of this Institution was held at Willis's Rooms, St. James's, on Thursday, May 26th, Mr. Basil E. Peto, the President, in the chair. There were six candidates for the three vacancies, viz., four men and two women. The poll was open from two to four p.m.

Shortly after the close of the poll the scrutineers, Messrs. Thomas Stirling and T. F. Rider, announced the results of the polling to be as follows, viz.:—James Picking, 25, Shillington-street, Clapham Junction, aged 61, builder (third application), 463 votes; Edward T. Roberts, 33, Broomwood-road, Wandsworth-common, aged 68, builder (second application), 1,585 votes (including sixty votes in respect of his former contributions); George N. Cott, 10, Mordaunt-street, Brixton, aged 69, builder (second application), 805 votes; James A. Abbott, 63, Stowe-road, Shepherd's Bush, aged 61, builder, 1,751 votes (including 210 added in respect of former contributions); Sarah A. Stableford, 366, York-road, Camden Town, aged 71, widow of Wm. Stableford, builder, 586 votes; and Ann Winter, 47, Maygrove-road, Brondesbury, aged 62, widow of Benjamin Winter, builder, 488 votes (including 290 votes added for her late husband's contributions). The successful candidates were therefore declared to be E. T. Roberts, J. A. Abbott, and Sarah A. Stableford.

Among the friends of the Institution (other than those already named) who took part in the proceedings, were Messrs. George Plucknett, J.P. (Treasurer); C. Bussell, T. G. Smith, T. Hall, W. Scrivener, H. Colls, and R. Richardson. A vote of thanks to the chairman terminated the proceedings.

COMPETITIONS.

The McArthur Hall, Belfast.—The designs submitted in public competition for the McArthur Hall, Belfast, have been submitted to Mr. Alfred Waterhouse, R.A., for adjudication. Those of Messrs. Newenham Deane (R.H.A.) & Son, 3, Upper Merrion-street, Dublin, have been selected.

Wesleyan Chapel, Newcastle-on-Tyne.—The designs of Mr. J. W. Taylor, architect, of Newcastle-on-Tyne, have been accepted for the new Wesleyan chapel, lecture-hall, class-rooms, and caretaker's house, to be erected in Dilston-road, Newcastle. The chapel, which is of Gothic design, will accommodate 850 persons, and the lecture-hall 400. The estimated cost of the building is 5,000*l.*, exclusive of site.

ARCHITECTURAL ASSOCIATION VISITS

THE first Saturday afternoon vacation visit of the Architectural Association was made on the 28th of May to Woolpits, Ewhurst, the house now being built for Mr. Henry Doulton, from the designs of Messrs. Ernest George & Peto.

From the site of the house magnificent views of the Weald of Surrey can be had, and the house has been designed with charming loggia, balconies, and belvidere, from which they can be seen.

The house is built of red bricks, which rise six courses to the foot, and buff terra-cotta dressings, the treatment of the detail being rather Flamboyant in character. The terra cotta, which was made by Messrs. Doulton, is the most perfect work of its kind, the trueness of the lines in the mouldings being particularly noticeable.

Over the entrance doorway a panel by G. Tinworth has been inserted, the subject being Abraham and the Three Angels, symbolising welcome; and over two of the mantelpieces large panels by G. Tinworth are placed. All the mantelpieces are of terra-cotta.

The stables and coachman's house, and the entrance lodge, are picturesque buildings with tile hanging and half-timber work.

The drainage and sanitary work are very perfect. A double system of water-pipes is arranged in the house, so that the service can be continued even if any of the pipes are under repair.

WATER SUPPLY.

Bristol.—Dr. D. S. Davies, Medical Officer of Health for Bristol, has recently issued his first annual report, in which he explains that he has endeavoured to put before the Committee the present position of the district in regard to those details which more especially go to make up the sum of "sanitary condition." Referring to the water supply, he says:—

"The water supply is in the hands of a private company. Water is obtained by gravitation from springs at Barrow Gurney (Coldbath Spring), five miles, at Watery Coombe, and at Chewton Mendip (Chew Hill Head), sixteen miles from Bristol, on the side of the Mendips, from springs in the Triassic conglomerates and in the Carboniferous limestone. A recent additional supply is also obtained from springs in the Carboniferous limestone at Sherborne. The water from the Sherborne and Coldbath Springs is brought direct into the city; that from Chew Hill Head and Watery Coombe is intercepted by the storage reservoirs at Barrow Gurney, 310 ft. above Ordnance datum, with an extreme holding capacity of 350,000,000 gallons; whence it is brought to the city, joining the direct supplies at Redcliff. The combined waters supply the lower parts of the city *en route*, and also rise by gravitation to the pumping station and reservoir at Oakfield-road, 200 ft. above Ordnance datum, from which they are pumped up to the Durdham Downs service reservoir, 320 feet above Ordnance datum, for the supply of Clifton and the higher parts of the district. The gravitation works were completed in 1851. After the dry winters of 1861-63, it was found necessary to provide permanent pumping works for a supplementary supply in dry years from wells at Chelvey, eight miles from Bristol, sunk in the New Red Sandstone (Triassic) 200 yards from any inhabited place. Two of these wells are 40 ft. deep, and a third 196 ft. The water is supplied to the city at constant service, except when turned off for necessary repairs. The present supply per head is calculated at about twenty-two gallons per day. A third reservoir is now in course of construction at Barrow, with a holding capacity of 500,000,000 gallons, which will practically double the available supply. As to any risk of excremental contamination, the water appears to be above suspicion; and no case of disease has, within my knowledge, ever been traced to its use. In the older parts of the city, many private wells still exist, the water from which is often preferred to the company's supply, on the ground of coolness, &c. It is difficult in most cases to convince consumers of the ever-present danger that must always attend the use of water drawn from wells in the midst of a large city, where the subsoil from which the water is collected is necessarily loaded with the filth resulting from the life-conditions of 223,000 persons."

Otley.—Major-General C. Phipps Carey, R.E., one of the Inspectors of the Local Government Board, recently held an inquiry at the Mechanics' Hall, Otley, respecting the Board's application for a Provisional Order to amend the Otley Local Board's Act of 1885, so as to give additional powers to acquire twenty-five acres of land, instead of seven acres, and to borrow 20,000*l.* instead of 7,500*l.*, as sanctioned in the original Act. Mr. C. S. Rooke, the Board's Engineer, went into details of his scheme, and said the reservoir would hold a fifty-three days' supply, allowing twenty gallons per head per day for the population, which was now some 7,000. Mr. Jas. A. Paskin, Water Engineer to the Halifax Corporation, and Mr. Arthur Guyfield, of Otley, gave evidence for the Board. Mr. Gledstone, who opposed the application on behalf of a number of ratepayers, said that the scheme had not been sufficiently considered by the Board, who had first bought the land and then consulted an engineer as to its suitability for water storage. He submitted that the supply gained by the proposed outlay would be quite out of all proportion to the cost, and would not meet the demands for any length of time. Evidence on behalf of the opponents was given by Dr. W. H. Cheetlam, Mr. Alfred Preston, C.E., and Mr. B. Woodhead, C.E.

Egg Buckland (Devon).—Two new stained-glass windows have just been placed in the south side of the chancel of St. Erasmas's Church, Egg Buckland. They are the work of Messrs. Fouracre & Watson, of Stonehouse. One of them contains a representation of the Blessed Virgin, whilst the other represents the patron saint of the parish, St. Erasmus.

ARBITRATION CASE.

THE GREAT NORTHERN RAILWAY COMPANY *v.* HER MAJESTY'S POSTMASTER GENERAL.

THIS arbitration, in which Sir Henry James, Q.C., Mr. Littler, Q.C., and Mr. Jeune appeared for the claimants, and the Attorney-General, Mr. Bidder, Q.C., and Mr. Casserley for the Postmaster-General, involving the question of compensation consequent upon the railway company's Bull and Mouth Depôt, Aldersgate-street, being required for the extension of the General Post-office, has been concluded. The hearing extended over a period of twelve days, and the umpire, Mr. Charles J. Shoppee, has awarded the sum of 31,350*l.* as the compensation to be paid to the railway company.

THE IMPERIAL INSTITUTE.

SIR,—The Organising Committee of the Imperial Institute have published an outline of their scheme for the government of that Institute, and they propose to appoint a General Council for the purpose.

Certain of the members of this Council are to be nominated by some of the learned and scientific societies, including no less than *four* societies devoted to the promotion of Engineering, but not one connected with Architecture.

It is stated in the opening paragraphs of the scheme that the "details are open to further consideration." It is to be hoped that the result of such further consideration will be to add the Royal Institute of British Architects to the list, especially as, if I am not misinformed, a Vice-President of that Institute is a member of the Organising Committee.

F. R. I. B. A.

May 30, 1887.

SIR,—Those of your readers who are interested in this new organisation will have noticed,—possibly, from experience, without surprise,—that Architecture has no representative on the General Council of Management. Amongst the forty-five members nominated on behalf of the United Kingdom are representatives from such societies as the Royal Irish Academy, the Society of Arts, the Institution of Civil Engineers, the Institution of Mechanical Engineers, the Iron and Steel Institute, the Chemical Societies, the Society of Telegraph Engineers and Electricians, the City and Guilds Institute of Technical Education, the Royal Academy, the Mining Association of Great Britain, the Trades Union Congress, and the National Miners' Union; but *not* on behalf of the Royal Institute of British Architects.

Few, if any, of the societies I have enumerated are as widely interested in the questions with which the Imperial Institute will have to deal as the profession of architecture is; and it must be considered a signal instance of unintentional, or marked, neglect, that a body so intimately mixed up with Colonial interests as our own should have been omitted from a list so comprehensive as to include all those mentioned above.

I do not know whether the Council of our own Institute has moved in this matter. If not, it has again shown a supineness with regard to passing events which, if characteristic, is none the less reprehensible.

It may not be too late to have this slight on the profession of architecture condoned, but this will certainly not be attained by the continuance of apathy on the part of our leaders.

J. WRECHITT CONNON.

Leeds, May 30th, 1887.

"A STUDENT'S NOTES ON GLOUCESTERSHIRE."

SIR,—I thank you and Mr. Paul for the very interesting paper. [See p. 814, *ante*.]

Allow me to say, if any student is taking the same ground, that I would advise him to come *vid* Oxford and Chipping Norton, to Bourton-on-the Water, as he is then only six miles from Northleach, and about ten from the Roman villa at Chedworth. The latter will teach him more of architecture than a cartload of books (if he has eyes to see), and no student should miss it.

Tetbury and Dursley are worth a visit; and near Gloucester there is the ruined Abbey of Llanthony waiting for some one to measure and draw it, and properly write its architectural history before it is finally carted away.

Upleadon Church, with its early sculpture, Churchdown, Burnwood, Bulley, and Newent churches are all worth a visit.

ROBERT PHILLIPS,
Clerk of County Works for Gloucestershire.

Chiswick Church.—In reference to a note of the visit of the Architectural Association to this church last week (see p. 798, *ante*), Mr. Griffiths, the clerk of works, writes to say that the teak and oak seats, &c., are not "polished," but only dry-rubbed.

PROVINCIAL NEWS.

Birkenhead.—The new Sessions and Police Courts at Birkenhead have lately been opened. The new courts, which are situate in Chester-street, adjoining the Town-hall, form part of a large scheme launched some years ago by the Birkenhead Corporation, involving altogether an outlay of about 100,000*l.* The foundation stone was laid on January 6th, 1885. The architects are Messrs. T. D. Barry & Son, of Liverpool, whose designs were selected in competition. The amount named by the architects as the probable cost of the complete structure was 32,500*l.*, and the tender of Messrs. A. Bleakley & Son, of Birkenhead, who offered to execute the building for 28,890*l.*, was accepted. The style of architecture adopted is Classical. The stone used in all the elevation of the buildings is from the Storeton Hill quarries. The system of ventilation adopted is that known as the "Plenum" system, which consists in the admission of the warmed or cooled air to such parts of the building as are to be treated, the air being admitted at the lowest level of the rooms. The Chester-street front, above the principal entrance, is arranged to form an open colonnade, recessed about 5 ft., containing columns with richly-carved caps. Above these on the two principal angles are square turrets, about 5 ft. square and rising to a height of about 15 ft., terminating in pediments supported by pilasters with carved caps. The space between these turrets is filled in by a mask wall about 10 ft. high, and immediately in front of this, though standing considerably above it, is a large sculptural group representing "Justice." This group, which is about 15 ft. high, including its base, represents the figure of the "Law Giver," which is itself 9 ft. 6 in. high, standing on a pedestal between the half-reclining figures of "Justice" and "Mercy." The two principal windows on the Chester-street front are surmounted by carved figures of emblematic design, whilst the tympana are filled in with very fine floriated carving. The principal windows facing north and south are crowned with circular-headed pediments, the tympana containing carvings representing Hope, Penitence, Justice, and Retribution. The whole system of speaking tubes, as well as of the fire-extinguishing apparatus, pipes, hydrants, and also the copper tape lightning conductor, were executed by Mr. A. Bucknall, of Renshaw-street, Liverpool; the other sub-contractors being as follows:—Glazing, Messrs. Lachland & Son, Birkenhead; ironfounders' work, Edward Jones, Conway Foundry, Birkenhead; carving, R. L. Boulton, Cheltenham; heating and ventilation, Messrs. Haden & Son, Trowbridge; wood block and fire-proof flooring, Mr. R. L. Lowe, Farnworth; ceramic mosaic, Mr. G. Swift, The Temple, Liverpool; marble lining to walls, Messrs. John Stubbs & Son; grates and mantels, Mr. James Roy; blinds, Messrs. Price & Patterson, Birkenhead; gasfittings, Messrs. R. Hamilton & Son, Conway-street, Birkenhead. The whole of the works were carried out under the superintendence of the architects, the clerk of works being Mr. Peter Thomas, of Liverpool.

Buxton.—The Local Government Board have lately given their sanction to an application by the Buxton Local Board for a loan of 6,000*l.* for providing offices for the proposed Free Library and Reading Room, subject to sanction being given for the appropriation of a plot of land for the library, as required by Act of Parliament. This, with the previous sanction of 2,000*l.* for a Town-hall, and 1,900*l.* from the insurance companies for the loss of the Market-hall by fire, makes up the 10,000*l.* necessary to complete the scheme for the erection of a Town-hall, Free Library, public offices, and market shops. It is stated that the Duke of Devonshire has promised a site of land free for a portion, if not the whole, of the buildings.

Isleworth.—Mr. S. Woodbridge, jun., of Brentford, has been appointed architect for the public hall to be erected at Isleworth to commemorate the Queen's Jubilee.

Leeds.—By the munificence of Mr. John North, of Leeds, a Semi-Convalescent Home is being erected at Cookridge, the institution being intended as an adjunct of the Leeds Infirmary. The architects are Messrs. Chorley & Connon, Park-row, Leeds. It is expected that the building will be ready for occupation about the beginning of 1888. According to the *Leeds Mercury*, the institution will afford accommodation for forty-two beds, and, should it be necessary to increase this number, some unappropriated rooms may be devoted to the purpose. The site is a portion of the grounds of the existing Convalescent Home at Cookridge, which have been extended for the purpose. The frontage is 230 ft. long, and the depth 120 ft. The structure will be faced with brick, the doors and windows having stone dressings. Picturesqueness will be imparted by the erection on each side of deep verandahs, which will afford shelter to the patients when out of doors, as well as by the elevated central administrative block. The general plan internally is intersected by a T-shaped corridor, the central arm forming the approach, and the head of the T leading right and left to the male and female sides. There are two large wards, 63 ft. by 24 ft., two 20 ft. square, and two 14 ft. by 12 ft. There are two day-rooms, each 27 ft. by 20 ft., with nurses' rooms, medical officers' rooms, servants' and nurses' bedrooms, cloak-rooms, kitchen, store-rooms, cellarage, &c. There is also a small detached mortuary. The cubical area allowed to each patient is somewhat in excess of that usually found in such institutions. It amounts to 1,300 ft. per patient. The well-known firegrates designed by Mr. Pridgin Teale will be used throughout the building. The bath-rooms, lavatories, &c., are to be in detached pavilions, one on each side of the main block, communication between these and the wards being intercepted by isolation lobbies. The whole of the house will be heated by steam, the cooking apparatus to be arranged in connexion with the same boiler. The estimated cost of the building, exclusive of furnishing, is 5,600*l.*, and Mr. North has already contributed 5,000*l.* The contracts for the new building have been let as follows:—Mason and brick work, Mr. Chas. Myers; joiner's work, Mr. Banks Mawson; plumber's work, Mr. George Lazenby; slater's work, Messrs. Sharp & Harper, plasterer's work, Mr. J. P. Mountain; and painting, Mr. Joseph Walker.

Newcastle-on-Tyne.—The foundation-stone of the Fleming Memorial Hospital was recently laid by Lady Armstrong. The architects are Messrs. Quilter and Wheelhouse, of London, whose design was selected in competition. The contract was given to Messrs. John and William Lowry, of Newcastle. The site of the building is a piece of open land, about three acres in extent, facing the Town Moor, and adjoining the Philipson Memorial Institution. The building is arranged with all the wards on the upper floor, having windows on both sides, ensuring a thorough circulation of fresh air and sunshine (when any of the latter is to be had). The grounds are surrounded by an iron railing, with entrance gates and lodge at the south-west corner. At the right of the entrance-hall is the committee-room, and on the left a waiting room, adjoining which is the separate entrance for out-patients and the porter's room. The surgery, dispensary, and drug store occupy a position in the north wing, beyond which is the residence of the medical officer, and the south wing is occupied by the matron's residence, with store-room, linen and work-room. Beyond the principal staircase eastward is the dining-hall, with passages and serving lobbies on each side. A paved playground is formed on each side of the dining-hall, in addition to a large grass playground, which occupies the east portion of the site. The whole of the upper floor is occupied by the wards and rooms for patients and nurses. In the centre of the west front, over the entrance, is a day-room for convalescents. On the east side of the principal staircase, over the dining-hall, are the surgical ward, operating-room and a small dark room for special cases. Isolation wards for four boys and four girls are arranged over the kitchen buildings, with a separate entrance, and provided with nurses' room, bath-room, scullery, and w.c. These have no internal communication with any other part of the building. The materials employed externally are dark red-pressed bricks with stone dressings for the walls, and green slates with red tile ridges for the roof. The internal fittings and the heating and sanitary arrangements are all of the most improved character. The general style of the building has been adapted from that employed during the sixteenth century in English domestic buildings, of which so many fine examples are to be found in various parts of the country. The entire cost of the work, including purchase of site, furnishing, &c., is 20,000*l.*, and is the gift of Mr. John Fleming, of Newcastle, in memory of his wife, Mary Fleming.

JAHN'S TRIPOD HEAD

FIGURE 1

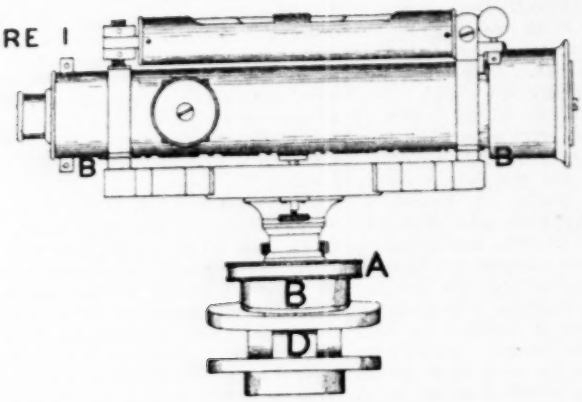
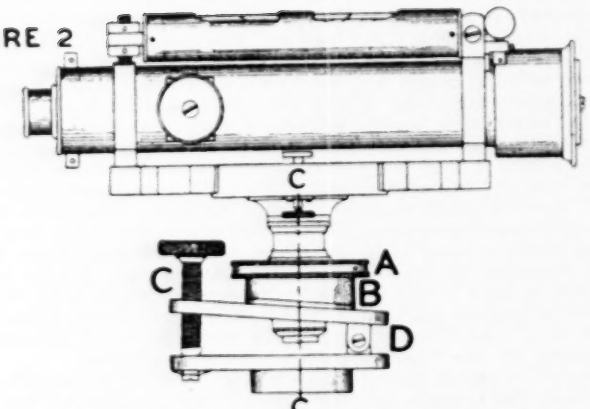


FIGURE 2

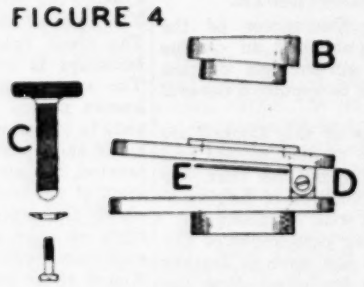


SECTIONAL PLAN ON LINE B-B —

FIGURE 3

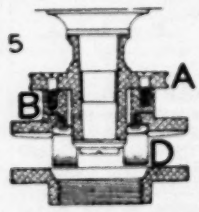
DETAILS

FIGURE 4



SECTION ON LINE C-C —

FIGURE 5



NOTE THIS INSTRUMENT IS SET LEVEL BY BEING PLACED ALTERNATELY IN THE POSITIONS SHOWN IN FIGURES 1 AND 2 - THESE POSITIONS ARE AT RICHT ANGLES TO ONE ANOTHER - THE ADJUSTMENT IN FICURE 1 IS EFFECTED BY MEANS OF THE WEDGE SHAPED CONNEXION B WHICH IS TURNED BY THE MILLED EDGE A AND THE ADJUSTMENT IN FIGURE 2 BY MEANS OF THE SCREW C — IN REVOLVINC THE TELESCOPE ON ITS AXIS THE WEDGE SHAPED PORTION B MUST BE MAINTAINED IN POSITION BY HOLDING THE PIECE A AS NO CLAMPINC ARRANCEMENT IS PROVIDED —

Norwich.—The ceremony of opening the new premises of the Church of England Young Men's Society took place on Wednesday, the 25th of May. The following accommodation has been added to the premises which were erected about ten years since:—In the basement, a large gymnasium, 65 ft. by 25 ft., and 19 ft. high; on the ground-floor (in addition to the existing reading-room, which will be used as a general reading-room and library), a room, 25 ft. by 30 ft., devoted to study and quiet reading, Secretaries' room, two class-rooms, and a refreshment-room; the lavatories have also been rebuilt and greatly enlarged; on the first floor, a large class-room, members' sitting-room, small class-room, and lavatories. The lecture-hall has also been enlarged. On the second floor two class-rooms and the resident superintendent's apartments; and two storage rooms on the third floor. The total area of the rooms as they now stand is about 7,050 square feet against the 2,500 square feet obtained in the old building exclusive of staircases and passages. The contract for the building was 2,720*l.*; extra expenses 350*l.*; and furniture and fittings 400*l.* The building was carried out by Mr. G. E. Hawes from the designs of Mr. Arthur J. Lacey, architect, Norwich.

Sculcoates.—The new Sculcoates parochial offices, which have been recently erected in Bond-street, were lately formally opened. The building is an adaptation of fifteenth-century Gothic architecture, in local red bricks, with stone dressings and shafts of polished shap granite to the ground-floor windows. The ground-floor provides a large rating office, with a strong room attached, and opening from it is the private office for the assistant-overseer. From the porch access is obtained by double doors to the stone staircase leading to the overseers' committee-room, which will also be available for other parochial purposes. The building has been erected in a substantial manner, the woodwork for the internal fittings, and also for the doors and windows, being of Stettin oak, which has been simply oiled and wax-polished. The fittings of the public office, supplied by Messrs. Audas & Leggott, are also in oak and wax polished, and executed from the architect's designs. The building has been erected by Mr. John Drury, of Beverley-road, who has had associated with him as sub-contractors, Mr. Jordan, mason; Mr. Kendall, carpenter and joiner; Messrs. Wright & Son, ironmongers; Mr. Taylor, plumber; Mr. Hunter, slater; and Mr. Drewery, painter. The gas-fittings were supplied by Messrs. Stones, Settle, & Wilkinson, and Messrs. Jones & Willis, of Birmingham. The whole of the works have been carried out from the designs and under the superintendence of Mr. Samuel Musgrave, F.R.I.B.A., Hull.

Warrington.—Large new warehouses have just been completed at the Bank Quay Soap Works, for Messrs. Joseph Crosfield & Sons. They adjoin the other buildings belonging to the firm, and each floor contains an area of about 5,700 superficial feet. All the walls are built of the best Wigan bricks, and the elevations are relieved with Cefn stone and pressed bricks. A special feature of the building is the roof, which has a span of about 60 ft., and is constructed of wrought iron and covered with Velenheli slates. On each side of the roof a skylight is formed, about 5 ft. deep, and the full length of the building. In elevation the treatment is of a plain but substantial character, with bases, copings, labels, and pediment of Cefn stone, and the openings in the main gable are filled with louvre boards and have moulded labels. The ground-floor is to be used for tablet-stamping and cutting soap, and the buildings are so arranged that five waggons can be loaded at the same time. The second-floor is to be used for a packing-room, and two hoists are fixed for loading the waggons below. A bridge has been constructed on the second floor so as to give access from old warehouse to the new buildings. The top floor is constructed of flitched beams resting on cast-iron columns and joists and covered with rebated boards. The ironwork has been executed by The Pearson and Knowles Coal and Iron Company, Warrington. The contract for the whole of the works has been successfully carried out by Mr. William Taylor, builder, Warrington, from plans and under the superintendence of Mr. William Perry, architect, Warrington.

The Student's Column.

FIELD WORK AND INSTRUMENTS.—XXIII.

Levelling Instruments.

VII.—JAHN'S LEVEL.

THIS instrument is illustrated by figs. 1 and 2, and consists of a levelling telescope mounted upon the ends of a horizontal bar, which is supported upon a tripod head, the details of which are shown in figs. 4 and 5. The telescope is set level by being placed alternately in the positions shown in figs. 1 and 2. These positions are at right angles to one another. The adjustment of the longitudinal bubble in fig. 1 is effected by means of the wedge-shaped connexion marked B, which is turned horizontally by the milled edge marked A, and the adjustment in fig. 2 is effected by means of the vertical screw marked

Fig. 1

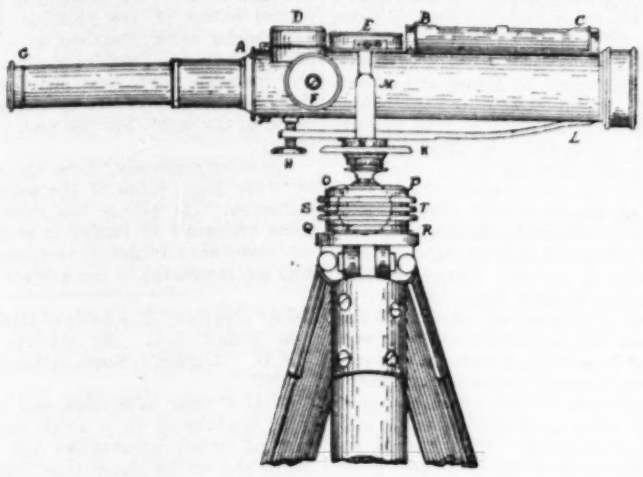


Fig. 2.

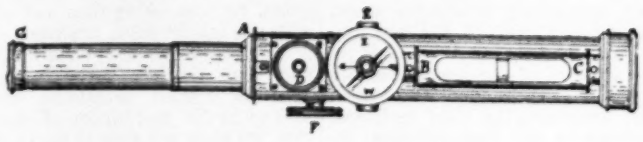
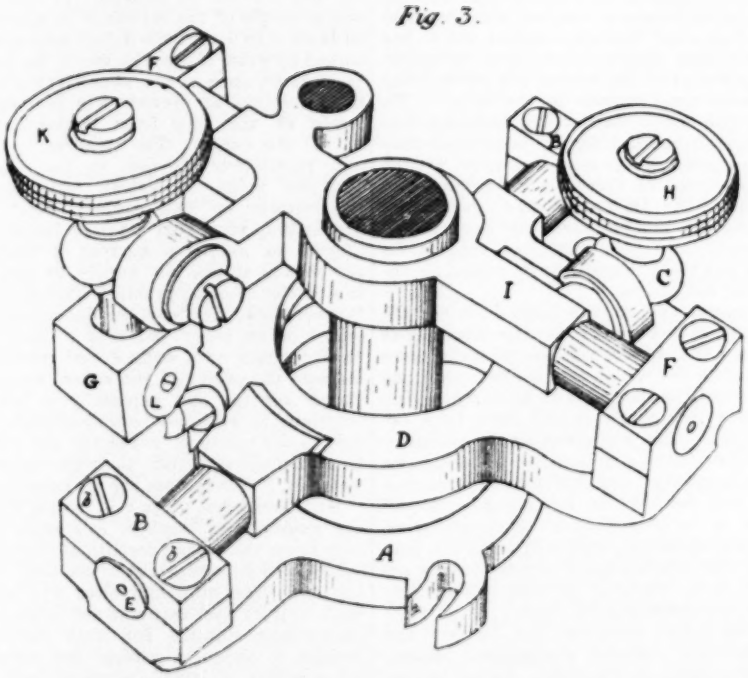


Fig. 3.



C. The comparative tightness of the adjustment may be effected by regulating the screws below the wedge-piece plate and of that fixed to the main body of the vertical axis cone. When attention is paid to this, the revolution of the telescope may be effected without disturbing the wedge-piece plate. Otherwise it must be held in position as stated upon the note in the diagram.

VIII.—STEVENSON'S LEVEL.

Figs. 1 and 2 of the annexed illustration show a levelling instrument invented by the late Mr. David Stevenson, M. Inst. C.E., in 1844. It consists of a 10-in. telescope, arranged to unscrew at A, so as to pack conveniently in two parts. B C represents the longitudinal level, D a circular, or, more correctly speaking, a spherical level, E a compass, F the screw for adjusting the focus when viewing an object, and G the eye-piece. The telescope rests in a support marked M, which is attached to the body of the instrument by a screw at N, and is secured to the tripod by a ball-and-socket joint, indicated by dotted lines in fig. 1. This joint is constructed to be clamped and unclamped by means of a screw, worked upon the inner circle of the piece marked S T. The telescope is balanced at M by the spring K L, and is acted upon by the elevating screw marked H. To set the instrument level the screw-plate S T is first unclamped and the telescope is carefully moved by the hand until the circular bubble at D appears central. The screw-plate S T is then moved by the hand so as to clamp the ball-and-socket joint, and the telescope being directed to the point of observation required, the final adjustment is effected by setting the longitudinal bubble B C in the centre of its run by turning the milled head of the screw H. It will be observed that in this instrument no preliminary setting of the level by the tripod legs is required, but that any movement of the telescope would necessitate the longitudinal bubble requiring to be re-adjusted to the centre of its run, in order to make the line of collimation horizontal.

IX.—SANG'S LEVEL.

One of the earliest forms of gimbal action employed to aid the setting-up of a level is shown in fig. 3, which illustrates the arrangement contrived by the late Mr. John Sang, of Kirkcaldy in Fifeshire. The lower portion, marked A, is secured to the head of the tripod, and the vertical axis of the telescope is supported in the central socket, which is connected by a horizontal axis, marked I, to socket-bearing at F F. These bearings are rigidly attached to the middle piece, marked D, which has an axis, E, working in the sockets B B. The axis B B is at right angles to the axis F F, and the trunnions of these two axes are formed by a double cone fitted into the socket-bearing and clamped by screws, marked *b b*. The milled-headed screws, marked K and H, work each in a nut, which by a revolving-joint are connected in each case to a crank arm, so that by their means the upper portion, marked I, is adjusted in one direction, and the central portion, marked D, is adjusted in the other direction, as required.

DISSENTING CHURCH-BUILDING NEWS

Carlisle.—The Warwick-road Presbyterian Church, Carlisle, has lately been reopened, after extensive alteration and improvement. The church was erected about twenty-five years ago, to meet the wants of the increasing congregation of Presbyterians in Carlisle. When the site was selected it was close upon the outskirts of the east end of the city, but since then numerous streets have been formed, and the church now occupies a site almost in the centre of the best part of the town. After the site had been purchased from the Earl of Lonsdale the services of an Edinburgh architect were obtained, and as the congregation at that time was small, and not very wealthy, it is recorded (says the *Carlisle Journal*) that the following very brief instructions were given, viz., "Mak it as plain as ye can, and be canny wi' the bawbees." The architect faithfully carried out their instructions, and the church has always ranked as one of the plainest internally in the town. Mr. T. Taylor-Scott, architect, of Carlisle, having been consulted, prepared plans for remodelling the whole of the interior, and the contract for carrying out the whole of the work was let to Mr. William Latimer, joiner, Victoria Viaduct. The most critical portion of the work was the roof scheme, as the whole of the interior construction of the large span roof, covering an area of 4,000 superficial feet, had to be removed and a new roof constructed without interfering with the slates and roof boarding.

Fowey.—A new Congregational chapel is being erected at Fowey, in place of the old one, which is not only dilapidated, but is in an obscure and out-of-the-way position. It is reached by two paths, one involving an ascent of seventy steps and the other forty-five steps, and was inaccessible to the aged and infirm, and even dangerous. The site for the new chapel is at the beginning of Lostwithiel-street. The building, which is of red brick, and Gothic in style, consists of a chapel and organ-chamber, with schoolroom and class-rooms behind. The architect is Mr. J. Wills, of Derby, the builders being Messrs. Penter & Cossentine, Polruan; and Mr. W. J. Sambell is clerk of the works. The cost is expected to be about 1,200*l*.

Glasgow.—The memorial-stone of a new United Presbyterian church, in course of erection in Lancefield-street, Glasgow, for the Cranstonhill U.P. congregation, was recently laid by ex-Preceptor Mathieson. The church, which has a frontage to Lancefield-street of 70 ft., is flanked right and left by small towers rising to a height of 55 ft. The wall between these is rusticated, and built to the circle, concentric with the seating inside. Access is had from two main entrances placed in the towers. The church inside is seated entirely to the circle, to accommodate about 900 persons. Behind, and having a frontage to Oak-street of 70 ft., is placed a building in which are constructed hall, session-house, vestry, &c. The hall is seated to accommodate about 300 persons, and has passages on each side for exit from church and hall into Oak-street. On either side of the passages are placed the vestry, retiring-rooms, session-house, and stair to hall gallery and meeting-room, also stair down to kitchen, &c. From the south vestibule in Lancefield-street a stair communicates to an underground passage and the lavatories. This passage leads across the basement to a large kitchen, heating-chamber, store, &c. The church is being built by Messrs. M'Kissock & Co., from designs by Messrs. H. B. W. Steel & Balfour, architects, and is Classic in style.

Mepal (near Cambridge).—A Munich window, by Mayer & Co., has lately been erected in Mepal Church, near Cambridge, representing "The Angel at the Tomb." The window is the gift of Mr. George Borwick Mead, M.D., of Newmarket, and is erected in memory of his wife, Elizabeth Bessie Owen, died December 6th, 1885, aged fifty-three years.

Books.

Circular Work in Carpentry and Joinery: a Practical Treatise on Circular Work of Single and Double Curvature. By GEORGE COLLINGS. London: Crosby Lockwood & Co.

THIS is one of "Weale's Rudimentary Series," and is an excellent example of what a book of this kind should be. Cheap in price, clear in definition, and practical in the examples selected, it will be a help to those who carry out work of the nature treated upon. The scarcity of hands who can undertake curved work, compared to those who can do straight work, is often a trouble to smaller employers when they have a job out of the common run. Mr. Collings's book gives simple and sufficient instructions for accurately setting out most of the forms that the carpenter and joiner is likely to meet with in ordinary practice. If, therefore, the employer has men of sufficient manual skill, there should, with this book to refer to, be no difficulty in compassing any forms within reasonable limits of single and double curvature. The work is divided into two parts, the first treating of simple curvature, and the second of complex circular work. In the former the more general forms are dealt with, such as solid-headed frames, elliptical heads, bulls-eye frames, Gothic forms, circular frames, &c. The way in which these should be set out is described and illustrated by suitable diagrams. The diagrams are based on geometrical principles, but nothing is introduced not necessary for the practical application of the instructions laid down. The second division of the book is naturally more complicated than the first, but here again the author's chief aim has been towards simplicity, and practical methods are used throughout. The author states that he has either himself executed, or seen executed by others, examples of all the work set forth in the book according to the rules laid down. We see no reason to doubt the accuracy of the various methods, although in some instances they may differ from the ordinary procedure of architects. It may be said, however, that where such differences arise Mr. Collings can claim the merit of greater simplicity. Altogether, the book is one to be recommended, and forms a most appropriate volume in Weale's series; none the less welcome because its principles will endure, and it is not likely to become valueless, even after twenty or thirty years' service.

St. Wandrille's Abbey: a Lecture, with Historical Preface. By ALFRED GATTY, D.D., Sub-Dean of York. London: G. Bell & Sons. Sheffield: Thomas Rodgers.

THIS is a pleasant, chatty, and amusingly naïve account of the author's one journey across the Channel, to visit the ruins of the Abbey of St. Wandrille, not far from Rouen, with which abbey his own parish of Ecclesfield had formerly been connected, the Church of Ecclesfield having been served in early days from the Abbey of St. Wandrille, which also (*temp.*, Henry I.) held property at Ecclesfield. The ancient priory, the original foundation of which is assigned by Mr. Hadfield to the date of *circa* 1250, now remains apparently in the form of a late Gothic building, which is in course of repair and conservative restoration, under the care of Mr. Hadfield. One or two sketches of the remains of the French mother-church are given, not very well, it must be admitted, at the hands of an amateur sketcher.

One cannot but sympathise with the wish of the author to see whatever was left of the French abbey church, which was the original mother-church to his own parish: he gives an account, brief and rather crude, but picturesque, of some bits of architectural remains known to few persons at present; and the simplicity of the narrative is amusing, even where it conveys no special instruction.

K. Baedeker Mittel-Italien und Rom. Achte verbesserte Auflage. Mit einem Panorama von Rom einer Ansicht des Forum Romanum. 8 Karten and 31 Planen. Leipzig. 1886.

THE eighth edition of Baedeker's Central Italy and Rome has just appeared. If the volume were a mere guide-book for the use of the tourist, to notice it would be superfluous; but the present edition should serve a wider purpose. The full details given as regards classical antiquities, sites, and excavations make it a practical hand-book of high utility, both for student and teacher. Any one who is reading Roman history will do well to have before him such a plan as, for example, that of the excavations between the Capitol and the Arch of Titus, and any one who is teaching Horace will find his work the livelier for occasional reference to the excellent Panorama of Rome and its surroundings, with Mount Soracte and the Sabine range. The book cannot claim to rank as quite equal with the "Rom und die Campagna" of Gsellfels, but it runs it close.

The Geology of England and Wales: with Notes on the Physical Features of the Country. By HORACE B. WOODWARD, F.G.S., of the Geological Survey. Second edition. London: George Philip & Son. 1887.

THE appearance of the second edition of this very useful work will be welcomed by all who take an interest in geology, whether they study the subject from a purely scientific or from a practical point of view. It differs in its construction from any other geological treatise with which we are acquainted. The professional duties of the author have unquestionably given him peculiar advantages in prosecuting his researches. The book is divided into three parts, has two appendices, a copious index, and a coloured geological map of England and Wales. The introduction to the work is occupied by an abstract of the elements of the science, given in a clear and suggestive manner.

The first part deals with the chief divisions, from the Archæan to the Carboniferous inclusive, and these are classed together under the term Palæozoic. In spite of the fact that the author takes up a more or less independent position with regard to controversial matters, he believes that there is no great break between the Archæan and Cambrian rocks; yet, it has frequently been demonstrated, that metamorphosed portions of the former are often found as a basal conglomerate in the latter! We observe with much satisfaction, however, that the Cambro-Silurian difficulty is bridged over by the adoption of the term Ordovician for the upper Cambrian of Professor Sedgwick. The extension of the Devonian and Carboniferous beds under the London basin are most admirably treated, and good practical suggestions are here and there thrown out in regard to undiscovered coal-fields.

The second part of the book describes the beds from the Permian to the Cretaceous inclusive. It has been customary in the more prominent of our recent text-books to class the Permian with the Palæozoic rocks, and we see no reason why this course should have been departed from. The one given by the author,—that they should be associated with the Triassic rocks on account of the similarity in their characters and methods of formation,—does not seem to us to be sufficient. Palæontological evidence is against it, especially so on the Continent. The Jurassic and Cretaceous series are handled in a masterly manner, particularly that portion describing the Lias.

The third part embraces the Tertiary and recent periods, volcanic phenomena, mineral veins, denudation, and scenery. We are pleased to notice that the necessity of classifying the Bovey Tracey beds with the Bagshots has been felt. Some of the subdivisions of the Tertiaries have, however, been very summarily disposed of. Surely the description of the highly fossiliferous Barton Clay ought to occupy more than a dozen lines. Each important section throughout the book concludes with a brief description of the economic products of the rocks comprised therein, and it is these portions of the work which would probably be most interesting to the majority of our readers, dealing, as they especially do, with building stones. The information under this heading, however, is not given in a connected manner. The book, as a whole, is a standard work of reference, and thus it is principally useful to us in referring to the stone quarries of particular districts. Here and there the author ventures to point out the better kinds of building stones, and sundry observations occur on the causes of the decay of stone.

The first appendix shows the relative thicknesses of strata passed through in several deep wells. The second,—by Mr. E. T. Newton, F.G.S., F.Z.S.,—is a synopsis of the animal kingdom, with especial reference to the fossil forms, which is exceedingly useful; we believe that a reprint of it is issued as a separate pamphlet. The coloured map, drawn by Mr. J. G. Goodchild, F.G.S., might have been executed on better paper, and its scale should have permitted a more minute sub-division of the formations. We must take exception also to the colour of the Archæan and Metamorphic rocks being identical, as certain portions of the map are thereby rendered inaccurate. For instance, there are many areas in which the Palæozoic rocks are metamorphic in every sense of the term, but the map does not show them.

Speaking generally, there can be no question as to the high value of the work as a book of reference. Its author has apparently left no stone unturned to render it complete, and we can therefore confidently recommend it to those who are interested in the subject.

School Hygiene: The Laws of Health in Relation to School Life. By ARTHUR NEWSHOLME, M.D. London: Swan, Sonnenschein, & Co. 1887.

THIS is a most admirable and practical little book, containing in a small compass a great deal of sound information put in a concentrated and at the same time intelligible form. A certain portion of the book is purely medical, having relation to diet, diseases, school accidents, &c.; but more than half of it is occupied with the construction, drainage, and ventilation of the buildings; and while we do not always find that medical men, in spite of their diatribes against architects, are really very well up in the mechanism of sanitary construction, we must say that as far as Mr. Newsholme goes into the subject he shows a thorough and workmanlike knowledge of it, and his sections of lavatory and closet drainage, &c., are careful and correct in showing the main outline and principle of the objects to be aimed at, and he is alive to some little details sometimes overlooked by even those who would be considered sanitarians, such as the necessity for a trap in a sink waste to prevent any foulness on the inside of the pipe from contaminating the air of the house. The remarks on warming and ventilation are also to be commended, and one point is drawn attention to in the chapter on this subject, which is often overlooked, viz., that when a furnace is employed to supply a current of warmed air, the source of the air supply to this furnace is a matter of great practical importance; "the furnace-room may contain decomposing vegetables or an empty bell-trap leading to a defective drain or a water-closet, none of which increase the purity of the school atmosphere." People are too apt, especially in the case of buildings in crowded neighbourhoods, to look only to the means of supplying and circulating air in the building, and to forget the important question, "Where does the air come from?"

Dr. Newsholme's book is mainly written for the guidance of teachers in schools, that they may know the proper conditions of health in a school, and be competent to see that these are kept up. The brief and clear wording of the book, and its moderate size and scope, render it particularly suitable for such readers, who require to obtain a general but sound knowledge within a small compass, and without too many technicalities.

Practical Electric Lighting. By A. BROMLEY HOLMES. Third Edition. London: Spon.

THIS little book is well got up, and gives in a concise form a *résumé* of the information on the subject which can be gathered from such writers as Thompson, Gordon, Dredge, Clerk-Maxwell, and others. To any one who knows nothing of the subject, and who wishes to obtain a popular knowledge of it, such a book will be fairly interesting; but we should not recommend it to a student who wishes to master the principles of electric lighting, as he will get them far better from the larger and more scientific treatises of the authors above mentioned. Indeed, we are disposed to question the advisability of multiplying the number of professedly non-scientific treatises on scientific subjects.

Levelling and its General Application. By THOMAS HOLLOWAY, of Chippenham, Wilts. London: E. & F. N. Spon, 125, Strand.

IN this work the author has fulfilled in a very able manner the task which (as stated in the preface) it was his intention to undertake, namely, to provide a book solely for the guidance of the uninitiated. The experienced practitioner will, however, find nothing new with respect to instruments, and, as regards

the portion of the book devoted to the general application of levelling, it would not be difficult to give many hints upon omissions, as invited by the author at the conclusion of the work. We are glad, however, to note some valuable remarks upon contouring, a subject generally omitted or very imperfectly alluded to in similar existing treatises, but described by the author in a very practical manner. We are sorry to find that the introduction of a column for "intermediate sights" in a level book is not recommended, as it facilitates the reduction of the levels that have been booked in the field to a common datum when checking the figures page by page. The author gives some important advice upon holding a level staff, but omits the all-important consideration of waving a staff in a vertical plane in order to obtain the shortest reading. We think also that he has shown rather too much partiality to one maker, although he has been fortunate in obtaining the loan of engravings of instruments from so eminent a maker as Mr. Stanley. There are other makers, such as Messrs. Adie, Cooke, Elliott, and Troughton & Simms, equally well known to surveyors generally. At the same time, we can heartily recommend the careful perusal of the pages of this book to young beginners. The print and binding of the book are attractive, and almost invite a study of the contents. A comprehensive index and a very practical list of questions for examination is added at the end of the book.

Elementary Plane Co-ordinate Geometry, as applied to the Straight Line. By W. E. ROBERTS, Architect and Government Surveyor, Durban, Port Natal. London: White, Holmes, & Stephens, Coleman-street.

THE author has in this work re-arranged and compiled in an intelligible form about one hundred pages of useful information connected with co-ordinate geometry. His chapters deal with the co-ordinates of points, areas of rectilinear figures, equations to straight lines referred to both rectangular and oblique axes, and polar equations to straight lines, together with several valuable explanatory problems. A knowledge of Algebra, Euclid, and Plane Trigonometry is assumed to have been acquired by the student, and the reader is then presented with the above subjects in a form which the author has found eminently successful with his own pupils, and which, if not so complete as furnished by many higher mathematical works, cannot fail to be of great assistance to the student in leading him through the most essential and practical portions in as simple a manner as the subject will permit. At the end of the book are added some remarks upon the application of the subject to survey calculations, the determination of co-ordinates and area of plots of land. We doubt the general usefulness of the application to surveys which the author would assign to it, but as an example of the principles laid down in the book this chapter is well placed. The subject has a wide range, and the information which the author has dealt with in his book places very clearly before mathematical students many practical methods. We are glad to see so reliable an authority upon conic sections as Todhunter quoted. The answers given at the end of the book to the problems contained within its pages will also be welcomed by those who desire to study the subject in the only way in which it can be properly learned, namely, with pen or pencil in hand, working out the examples.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

7,797, Glazing. C. F. Elliott.

In this invention, putty or cement is dispensed with; and the improvement consists in the particular form of, and connexion between, the sash-bar and cap, which is such as to allow for expansion and contraction. The sash-bar is provided with wings, the edges of which are turned up, and provided with grooves or channels to receive packing strips. These turned-up flanges and packing strips form the seat or bed for the glass sheets. The sash-bar is sometimes provided with a wooden core. The form of the sash-bar or astragal is claimed by the patentee, and also dies for stamping out the metal in this particular form.

7,884, Outlets for Ventilators. T. G. Normanton and S. E. Major.

This invention relates to a chimney cap of rather elaborate construction, which exhausts the air in the shaft by creating a vacuum in the cap when the air impinges on the exterior of an air-chamber constructed therein. The intensity of the force of the up-current may be augmented by placing a shield or plate in the interior of the cap, which is made of metal, and is designed for terra cotta or earthenware chimney or ventilating tops.

8,120, Portland Cement. S. Lowden.

The object of this invention is to manufacture a nucleus of cement which may be transported from place to place; so that the cement may be cheapened by reducing the cost of transport, and by the use of this nucleus to make the cement on the ground where it is to be used, whenever chalk or limestone is found in the vicinity.

8,145, Improvements in Water-closets. W. Smeaton, sen.

This invention consists mainly in the introduction of an intermediate turret or cover placed between the bottom of the closet-pan on the top of the syphon or other trap. The turret may be turned in any position, and thus a connexion of the closet and soil-pipe may be effected independently of the situation of either.

8,152, Lead Glazing. H. M. Keene.

According to this invention, a strip of metal,—lead preferably,—with a ridge in the centre of the strip, is fastened down the centre of the rafters. The thin portion of the strip is then turned well back against the narrower portion (the ridge), the glass is laid on the rafters, and the thin edges are flattened to the glass and smoothed with an ordinary putty-knife.

8,175, Window-sashes and Sash-frames. T. Howdill.

This is claimed as an improvement chiefly designed to avoid the risks of cleaning windows from the outside, and also to improve the ventilation of the rooms. The sashes are hinged and secured to the sliding stile at their lower ends by means of centre hinges, in such a manner that the sashes can be tilted or drawn inward, leaving the outside uppermost. When desired, one or both sashes may be tilted so as to form a kind of hopper ventilator.

NEW APPLICATIONS FOR PATENTS.

May 20.—7,337, S. Oldershaw and D. Butt, Machines for Cutting or Stamping Holes in Slates, &c.—7,356, J. Armstrong, Lead Glazing.—7,378, W. Mosley and J. Lewis, Electric Indicators and Bells.—7,381, J. Dudley and J. Hamilton, Concrete and Artificial Stone Mantelpieces.—7,389, R. Fladgate, Securing Double Doors, Panels, &c.

May 21.—7,411, A. Busch, Manufacture of Cement.—7,448, J. De Winton, Machinery for Sawing Slate, &c.

May 23.—7,485, A. Boult, Wire Cloth for Lathing.—7,496, E. Olander, Trough Girders for Floors of Bridges, Roofs, Columns, &c.

May 25.—7,517, T. Tyzack, Saws.—7,524, H. Lake, Manufacture of Pigment or Paint.—7,539, A. Smith and Others, Portland Cement.—7,571, J. Tuckett and G. Foster, Security Mortise Lock.—7,578, H. Wilson, Window-sash Fasteners.—7,584, H. Schallehn, Domestic Fireplaces.

May 26.—7,644, F. Wicks, Paving, also applicable for Flooring, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

5,211, N. and L. Skelsey, Disinfecting Apparatus for Water-closets.—5,769, H. Hartland, Firebricks.—5,815, T. Lodge, Manufacture of Portland Cement.—6,152, W. Thompson, Portable buildings.—6,651, H. Bensted, Water-closet Pan.—4,242, M. Hoffman, Artificial Majolica, &c.—5,108, J. Rimington, Drain Gullies.—5,928, H. Richardson, Piercing or Boring Holes in Walls constructed of Brick, Stone, &c.—6,346, A. Morse, Roofing and Wall Tiles.—6,884, F. Chapman, Nails.—6,937, R. Ripley, Paint or Colouring for Metal Work, Stonework, Stucco, &c.—6,958, J. Campbell, Glue.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

8,222, J. Dulston, Wood-turning Machines.—9,244, S. Yeates, Surveyors' Levels.—9,320, W. Bartholomew, Water Supply and Discharge Fittings for Baths and Lavatories.—9,608, J. Newman, Pneumatic Door Checks and Combined Door Checks and Springs.—9,643 and 9,644, H. Lake, Construction of Walls, Ceilings, &c.—10,960, M. Benedictus, Material for Removing Old Paint.—5,723, S. Pitt, Manufacture of Building Materials from Glass.

Restoration of a Roman Aqueduct.—The *Kölnische Zeitung* states that, by order of the German Government, the Roman aqueduct near Ars, on the Moselle,—one of the greatest Roman works north of the Alps,—is to undergo thorough repair in the course of this summer. Of this structure, which dates from the time of Augustus, and originally spanned the whole valley of the Moselle, there remain on the left bank of the river nine, on the right bank seventeen piers, some of them to a height of 18 mètres. The work of restoration, which is superintended by Dombaumeister Tornow, will be confined to the preservation of the existing remains.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

MAY 23.

By MURRELL & SCOBELL.

Betchworth—Freehold house, saw mills, and out-buildings	£1,350
Hyde Park—24, Connaught-square, 58 years, ground-rent 16*l.* 16s.	2,190

By R. J. COLLIER.

Wood Green, Ewart Grove—The Laurels, Freehold	765

By Messrs. CRONIN.

Gray's Inn-road—No. 344, freehold	800
Fulham-road—Nos. 178 and 180, term 14 years, ground-rent 20*l.*	245
St. John's Wood—22, Carlton Hill, 50 years, ground-rent 12*l.*	860
Portman-square—5, Gloucester-street, and stabling, 36 years, ground-rent 80*l.*	1,600

By GRAVES & SON.

Marylebone—46, Church-street, 34 years, ground-rent 10*l.* 10s.	420

By Messrs. TAPLIN.

Brixton—6 acre-lane, 19 years, ground-rent 8*l.*	760

By FURBER, PRICE, & Co.

Holloway-road—Ground-rents of 80*l.*, reversion in 76 years	2,020
Marylebone—8 and 10, Great Barlow-street, 35 years, ground-rent 14*l.*	720

By ROBERTS & BARNARD.

North Kensington—114, Wormington-road, 87 years, ground-rent 7*l.* 10s.	290
28, Wheatstone-road, 88 years, ground-rent 7*l.* 10s.	290
Belvedere, Kent—Ground rents of 26*l.*, reversion in 79 years	590

By T. WOODS.

Anerley—Ground-rent of 84*l.*, reversion in 57 years	2,000

By E. WOOD.

Stoke Newington—36, Foulden-road, 85 years, ground-rent 6*l.*	240

By DYER, SON, & HILTON.

Lee—71 and 73, Burnt Ash-road, 79 years, ground-rent 20*l.*	500

MAY 24.

By BELTON & SONS.

Forest Gate—59, Leyton-road, 82 years ground-rent 7*l.*	265
Leyton-road, Vansittart-road—A plot of freehold land	215

By S. HERRICK.

Clapham—1 to 7, St. John's-road, freehold	5,450
Kingston-on-Thames—1 to 5, London-road, freehold	1,600

By E. TABERNACLE.

St. John's Wood—Improved ground-rents of 35*l.*, term 67 years	605
Improved ground-rents of 111*l.*, term 67 years	1,955

By WESTON & SON.

East Dulwich—8 to 14 even, Hinckley-road, 81 years, ground-rent 26*l.*	850
Brixton Hill—1 and 3, Appach-road, 78 years, ground-rent 16*l.*	540
26, Barrington-road, 25 years, ground-rent 2*l.* 4s.	300
43, Holland-street, 12 years, ground-rent 7*l.* 16s.	120
Clapham—86, 88, and 90, Wirtemberg-street, 13 years, ground-rent 8*l.* 15s.	385
1 and 2, White-square, freehold	260

By G. STOCKINGS.

Pimlico—17, Pulford-street, 27 years, ground-rent 3*l.* 9s.	275

By C. W. DAVIES.

Barnsbury—95, Bride-street, 21 years, ground-rent 9*l.*	200
Islington—91, Cloudesley-road, 34 years, ground-rent 4*l.*	275

By A. RICHARDS.

Enfield, High-road—Freehold detached house	500

By E. & H. LUMLEY.

Hanover-square—The lease of 27, George-street, term 13 years	1,025

By C. & H. WHITE.

Camberwell—9 to 15, Palmerston-street, 64 years, ground-rent 24*l.*	1,645
11 and 13 to 21, Cambridge-street, 64 years, ground-rent 33*l.*	2,025
22 and 24 to 28, Cambridge-street, 64 years, ground-rent 21*l.*	1,255
Improved ground-rents of 15*l.*, term 64 years	210
Lambeth—Improved ground-rents of 15*l.* 10s., term 72 years	235

By WELLS & READ.

Walthamstow, Castle Avenue—A plot of freehold land	130

By C. D. FIELD & SONS.

Regent's Park—Improved ground-rents of 12*l.* 2s., term 31 years	110
Southwark Park-road—No. 104, 48 years, ground-rent 6*l.*	400
Southwark Bridge-road—A plot of land, area 5,150 feet, term 999 years, ground-rent 1s.	900

By DEBENHAM, TEWSON, & Co.

Belgravia—1 and 2, Ebury-street, 36 years, ground-rent 12*l.*	2,120
Bermondsey—69, Long-lane, freehold	630
24, Crosby-row, and 1 to 9, Prince's-place, freehold	1,000

By WALKER & RUNTZ.

Clerkenwell—9 and 10, Coldbath-square, freehold	1,190
King's Cross—185 to 207 odd, King's Cross-road, freehold	8,510
183, King's Cross-road, and 31 and 32, Field-street, freehold	680
25 to 30, Field-street, freehold	1,540
10 to 16 even, St. Chad's-place, freehold	225
1 to 11 odd, St. Chad's-place, freehold	800

MAY 26.

By WEATHERALL & GREEN.

Lambeth—48, Lower Marsh, 24 years, no ground-rent	640
St. John's Wood—26a, Park-road, 25 years, ground-rent 12*l.*	630
Holloway—11, Drayton Park, 76 years, ground-rent 8*l.*	530

By A. WALTON.

Hoxton—52, Allerton-street, 21 years, no ground-rent	195

By PHILLIPS, SON, & NEALE.

South Belgravia—89, Cambridge-street, 44 years, ground-rent 8*l.*	£600

By INMAN, SHARP, & HARRINGTON.

Walthamstow—Ground-rent of 12*l.* 10*s.*, reversion in 93 years	305
Leyton—Ground-rent of 10*l.*, reversion in 68 years	230

By J. MCLACHLAN & SONS.

Lambeth—Improved ground-rents of 87*l.* 5*s.* 4*d.* term 37 years	1,470
Chelsea—Improved ground-rent of 19*l.* 10*s.*, term 22 years	215
Clapham—49, Manor-street, 21 years, ground-rent 5*l.* 10*s.*	320

By NEWBON & HARDING.

Dalston—71, Shrubland-grove East, 61 years, ground 5*l.*	300
Kingsland—64 and 66, De Beauvoir-road, 31 years, ground-rent 7*l.* 4*s.*	590
Hoxton—45, Essex-street, 82 years, ground-rent, 6*l.* 5*s.*	350
Holloway—24, St. John's Park, 64 years, ground-rent 8*l.*	430
36, Mildmay Park, freehold	830

By E. STIMSON.

Bermondsey, Jamaica-road—A plot of freehold land	750
5 to 8, Bermondsey-square, freehold	1,140
Wandsworth—1, the Grove, freehold	230
11 to 19, Borrodaile-road, freehold	1,450
West Dulwich—6 and 6a, Buccleugh-road, freehold	435
40, Chancellor-road, freehold	330
Southwark—125 and 128, Great Suffolk-street, freehold	1,190
Camberwell—22, 24, and 32, Picton-street, freehold	890
2, 4, and 6, George-street, freehold	840

By C. R. CROSS.

Uxbridge-road, Askew-road—"Delhi Lodge," 68 years, no ground-rent	485

MEETINGS.

SATURDAY, JUNE 4.

Association of Municipal and Sanitary Engineers and Surveyors.—Home Counties District Meeting at Portsmouth. Paper by Mr. Boulnois on the Drainage Works of Portsmouth, recently carried out by Sir Frederick Bramwell.

St. Paul's Ecclesiological Society.—Visit to Cobham. Train from Holborn, 3.15 p.m.

MONDAY, JUNE 6.

Surveyors' Institution.—(1) Annual General Meeting to receive the Report of the Council and to elect officers for the ensuing year. (2) Distribution of Prizes. 3 p.m.

Society of Biblical Archæology.—8 p.m.

Institution of Civil Engineers.—Annual Meeting of Corporate Members only, to receive the report of the Council and to elect the Council and Officers for the ensuing year. 8 p.m.

THURSDAY, JUNE 9.

Architectural Association.—Annual Dinner, Holborn Restaurant.

Society for the Encouragement of the Fine Arts.—Third *Conversazione* at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly. 8 p.m.

FRIDAY, JUNE 10.

Royal Institution.—Mr. Thomas Hodgkin on "Aquileia the Precursor of Venice." 9 p.m.

SATURDAY, JUNE 11.

Architectural Association.—Visit to Banstead Park, the residence of the Hon. Francis Baring. (See advertisement on p. xvi.)

Miscellanea.

The Iron Process for Sewage.—In the course of a recent report to the Health and Drainage Committee of Windsor, by the Chairman of the Committee and Mr. Alderman Lundy, in referring to the treatment of the sewage at Chichester Barracks by the iron process, says:—"The application of sulphate of iron is very simple, and the precipitate, occurring below the outfall, was perfectly free from offensive smell. A careful examination of the sewage resultant shows it to be a true chemical precipitate, which soon desiccates, when it may be handled with impunity. The effluent possesses a high degree of purity. The sewage discharge, which is weak, as thirty-four gallons of water are daily supplied per head, amounts to 15,000 gallons in twenty-four hours. Mr. Conder's scheme is that the crushed dissolved sulphate of iron must be applied continuously; that the gentle flow and the absence of light, such as occur in every sewer, render the chemical operations of sulphate of iron on sewage most effectual; that is, darkness and agitation are essential to make the experiment effectual. . . . . It yields a deposit free from associated water, unlike lime and other reagents, which do not destroy sewage matters, but aggregate them into sludge,—a resultant most difficult to get rid of and expensive to deal with."

Cremation.—During the past eight months there has been carried on upon a large scale, in the midst of a populous part of London, a system of cremation the results of which have, after severe trials, proved highly satisfactory. In the summer of last year a serious difficulty arose at the Temporary Home for Lost and Starving Dogs, in Battersea, in consequence of the local authorities of the district, where the dead bodies had hitherto been disposed of, having refused to allow of their being received there any longer. At a public meeting of the supporters of the Institution, it was decided that the bodies should be destroyed by cremation. A furnace has been erected in a small yard at the extremity of the Society's premises near to the Battersea Park-road, and consisting of a close-chamber (capable of containing about 120 dead dogs) constructed with bottom, sides, and arched tops, of Stourbridge fire tiles, specially made and supplied for this purpose by Messrs. Cull & Son, of Palmerston-buildings, London. Underneath the chamber is placed the furnace, from which a series of cells or flues, after conveying the flames round the sides and top of the chamber for its whole length, are led by a longitudinal flue along the top, into a shaft, about 70 ft. high, built over the entrance to the furnace. The bodies of the dogs which have been destroyed in the lethal chamber on the previous night are placed in the morning in layers on the floor of the chamber until it is nearly full, leaving a space all round between the bodies and sides and top of the chamber, after which the opening is closed by a heavy cast-iron door (which is raised or lowered at pleasure) and hermetically sealed. The fire, which has previously been lighted in the furnace beneath, is then actively increased until the bottom, sides, and top of the chamber become red-hot. The gases which are created in the chamber are led back, by openings specially arranged for the purpose, into the furnace beneath, where they ignite, and, together with the contents of the chamber, become a mass of flame, thus rapidly and effectually completing the process of cremation. After the products of combustion in the close chamber have passed through the fire, they are then conducted (together with any smoke from the fire itself) through the series of super-heated flues before entering into the shaft, with the result that the whole is consumed, nothing being left but a small quantity of incinerated bones and ashes, which are eventually disposed of for manure. The furnace was designed by Mr. E. Crutchloe, the architect to the Committee, and carried out by Mr. W. Neil.

Opening of the New Windsor Lines of the London and South-Western Railway. The additional double lines of rails, between Clapham and Barnes, for the purpose of giving increased facilities for the traffic on the London and South-Western Company's Windsor system, were opened on Wednesday. The works, which have been in course of construction for upwards of three years, have involved a very large outlay in actual works, in addition to the heavy expenditure which has had to be incurred in the purchase of the necessary land along the line of route. All the bridges crossing over the several roads between Clapham and Barnes have been rebuilt and widened, and the stations at Wandsworth, Putney, and Barnes have all been reconstructed and very much enlarged. The most costly portion of the undertaking has been at Wandsworth, where the new and widened lines are carried over York-road by massive iron girder bridges. The former old station, which was one of the most inconvenient on the company's system, has been replaced by a large and very commodious new station, about 1,000 ft. in length and 200 ft. wide, with spacious station buildings on the north and south platforms, and also on a central platform, upwards of 50 ft. in width, all these several platform buildings being supplied with numerous waiting-rooms and station-masters' and other offices. All the platforms are about 700 ft. in length, the greater portion being roofed over. The booking-offices are on the north side, being reached through a spacious booking-hall, 60 ft. long and 30 ft. wide. From the booking-hall the railway platforms above are approached along a subway extending entirely under the railway from the north to the south side. From this subway the platforms are reached by a central and north and south staircases. The subway is 12 ft. wide, and faced on each side with white enamelled brick, and well-lighted from the railway level above. A large open area in front of the approach to the booking-hall will be appropriated as a cab-stand. The works have been carried out from the designs of the late Mr. W. Jacomb, the company's engineer-in-chief, whose painfully sudden death took place on Thursday week, as elsewhere mentioned, and who was interred at Wimbledon Cemetery on Tuesday last in the presence of several of the directors and large numbers of the company's officers and *employés*. Messrs. Perry & Co., of the Tredegar Works, Bow, are the contractors.

Electric Lighting.—The Gülcher Electric Light and Power Company, Limited, have completed the lighting of a house at Elsted, near Petersfield, for Mr. E. A. Nevill. An engine-room has been built between two stone buildings specially roofed over and paved; the total distance from the house being about twenty-five yards. The plant consists of a two horse-power Spiel's petroleum engine made by Messrs. Shirlaw & Co., of Birmingham, which drives a No. 1 Gülcher shunt-wound dynamo machine. The dynamo charges a battery consisting of twenty-seven Elwell-Parker 15-plate cells which are used to store the electricity for use during the night. A Mountain's improved switch board is placed by the dynamo machine and is used for charging and discharging, running the dynamo and accumulators together in case of emergency or running the lamps direct from the dynamo. A five-contact switch is also provided on the same slate slab for adding extra cells as the E.M.F.* falls, and the volt and ammeters, with measuring-plugs, are arranged so that by inserting or withdrawing a plug the E.M.F. can be measured. The current from the dynamo-room is led to the house by a pair of 7-15 cables made by Messrs. Callender & Co., supplying thirty-eight lights. In the hall special hammered iron brackets have been used in order to lend themselves to the old character of the house. In the bedrooms special rising and falling pendants, designed by Mr. Mountain, have been placed, either one on each side of the toilet table or over the centre of the looking-glass, and as these fittings are made to swing from side to side the light can be brought into any desired position. Throughout the house the shades are of cut glass. This installation is one of the first where a Spiel Petroleum Engine has been used for private house lighting.

The Registration of Plumbers.—The movement for the registration of plumbers, inaugurated by the Plumbers' Company of London, has, we are glad to see, extended to Scotland, and on the 24th ult. a successful meeting was held in the Town-hall, Dundee, presided over by Provost Ballingall, and addressed by Mr. W. R. E. Coles, C.E., and Mr. G. Young. In the course of the proceedings, the Provost said that they in Dundee had in prospect the foundation of a Technical Institute in connexion with University College, and he had no doubt that the Institute would give young men who were desirous of being educated practically and scientifically in the plumbing trade every opportunity of being so. Professor Ewing, Professor of Engineering in the University College, took a great interest in the Dundee and District Sanitary Association, and his connexion with the late Professor Fleeming Jenkin gave him the assurance that if a class for the technical education of plumbers was to be set up in connexion with the Institute very great good would result to Dundee and district. Eight practical plumbers from different parts of Scotland, including Broughty Ferry, Aberdeen, Cupar Fife, Inverness, Duns, and Oban, were present at the meeting, and received certificates of registration, their signatures being attested by the Provost.

The South-Western Railway Company's New Locomotive Works at Nine Elms.—The new departure which the London and South-Western Railway Company are about to take in the construction of their own locomotives will, it is stated, shortly give employment to about 2,000 working engineers and other artisans at the new locomotive works at Nine Elms, now in course of preparation. The company's engines have hitherto been supplied by private engineering firms, but the increasing extent and magnitude of the undertaking has determined the company to be the builders of their own engines, thus following in the footsteps of the London and North-Western and other leading companies. A considerable portion of the extensive depôt at Nine Elms, occupying several acres on the south side of the line, is being set apart for carrying on the locomotive works, and new buildings and machinery are at present being erected preparatory to commencing the manufacture of the Company's engineering plant. In the meantime the first engine has for some time past been in course of construction, and is intended to be placed on the line for working the traffic on the day of the Queen's Jubilee, the designation given to the engine being the "Jubilee."

* That is, "electro-motive force."

Monument to the Marquis of Montrose. We mentioned a little while ago that a monument was to be erected in St. Giles's, Edinburgh, to the memory of the celebrated Marquis of Montrose. This has been designed by Dr. Rowand Anderson, and is to be executed by Mr. Rhind. We take the following particulars from the *Scotsman*:—"The monument will be erected on the east wall of the Montrose aisle. It is in the Renaissance style of the seventeenth century, and is suggestive of the form the monument would probably have taken had it been erected at the time Montrose was buried. The principal feature in the design is a semi-circular arch deeply recessed, having in the recess a sarcophagus, with black marble bier carrying the recumbent figure of the Marquis. The archway is flanked by two Corinthian pillars in black and gold marble, with caps and bases of alabaster. In the centre of each of the pillars is an alabaster wreath. These pillars are surrounded by a frieze, entablature, and cornice, with ornamented pinnacles. The frieze is decorated with floral wreaths and panels. The latter contains one of the Montrose mottoes, 'N'oubliez,' while the rose of Montrose and the clam shell of the Grahams are also worked into the design. In the frieze immediately above the pillars is a panel with the favourite device of the Marquis,—a lion leaping from one rock to another, with the motto 'Nil Medium.' Rising over the cornice, and between the pinnacles, is a large ornamental panel, in which is quartered the full coat of arms of 'The Graham,' flanked by richly-carved pillars and dolphins, and surmounted by a pediment. In this pediment is another of the Montrose crests,—a gloved hand grasping a porcupine, with the motto, 'Col Senno a con Lamano.' The monument is finished off by another panel, which rises over the pediment, containing yet another crest,—an eagle destroying a stork. The work will be carried out in coloured marbles and alabaster. The cost will be about 1,000*l*."

"The Stones of London": Temple Bar. "An Architect" writes to the *Pall Mall Gazette*:—"I hear indirectly, but on substantial authority, that Temple Bar, notwithstanding all promises, has been sold, and will be re-erected in private grounds. If this had been the Bridge of Sighs! And yet the 'stones of London' are fewer than those of Venice. . . . . I cannot think that the gentleman who has bought it would not on public and historic grounds consent to forego his purchase if there were a desire to preserve it in London. In one of the parks, with the colonnade of Old Burlington House,—another derelict of exactly harmonious style,—to lead up to it or make a portico-like shelter, a fine composition might be made, and the future sneer averted."

Distressingly Healthy.—At the first meeting of the New Blayden (Northumberland) Local Board, the medical officer of health created considerable amusement by his congratulatory report, in which he said:—"Since last meeting nothing whatever has occurred of medical interest in your district. The high state of health extending over so lengthened a period is still fully maintained. It is really altogether remarkable. Personally I may fairly claim to join in the doleful and all too general cry, 'Ah, yes, indeed; trade is very slack!' Could I pay a higher compliment to the good officers of your Board?"—*The Sanitary Record*.

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	10	0	7	10	0
Teak, E.I. ....load	8	0	0	13	0	0
Sequoia, U.S. ....foot cube	0	2	3	0	3	0
Ash, Canada ....load	3	0	0	4	10	0
Birch ,, ...	2	0	0	3	10	0
Elm ,, ...	3	10	0	4	10	0
Fir, Dantsic, &c.	1	10	0	4	0	0
Oak ,, ...	2	10	0	4	10	0
Canada	3	0	0	6	0	0
Pine, Canada red	2	0	0	3	10	0
,, yellow	2	10	0	4	10	0
Lath, Dantsic ....fathom	3	0	0	5	0	0
St. Petersburg	4	0	0	5	10	0
Wainscot, Riga ....log	0	0	0	0	0	0
,, Odessa, crown....	2	15	0	3	0	0
Deals, Finland, 2nd and 1st...std.100	7	0	0	8	0	0
,, 4th and 3rd	5	10	0	6	10	0
Riga	5	10	0	7	0	0
St. Petersburg, 1st yellow	8	0	0	13	0	0
,, 2nd ,, ...	7	0	0	8	0	0
,, white	6	10	0	8	10	0
Swedish	6	0	0	15	0	0
White Sea	7	0	0	16	10	0
Canada, Pine, 1st	16	0	0	24	0	0
,, ,, 2nd	10	0	0	15	0	0
,, ,, 3rd, &c.	6	0	0	9	0	0
,, Spruce, 1st	8	0	0	9	0	0
,, ,, 3rd and 2nd	5	0	0	7	0	0
Deals—New Brunswick, &c.	5	0	0	6	10	0
Battens, all kinds	4	0	0	10	10	0
Flooring Boards, sq., 1 in., prepared, First	0	8	0	0	11	0
Second	0	6	6	0	7	6
Other qualities	0	5	0	0	6	0
Cedar, Cuba ....foot	0	0	3	0	0	3½
Honduras, &c.	0	0	2½	0	0	3½
Australian	0	0	2	0	0	3
Mahogany, Cuba	0	0	4	0	0	7
St. Domingo, cargo average	0	0	4	0	0	6
Mahogany, Mexican, cargo av.	0	0	3½	0	0	4
Tobasco ,, ...	0	0	4	0	0	5½
Honduras ,, ...	0	0	3½	0	0	5½
Maple, Bird's-eye	0	0	6	0	0	8
Rose, Rio ....ton	0	0	0	0	0	0
Bahia....	0	0	0	0	0	0
Box, Turkey ....ton	5	0	0	12	0	0
Satin, St. Domingo ....foot	0	0	5	0	0	10
Porto Rico	0	0	6	0	0	10
Walnut, Italian	0	0	4	0	0	5
METALS.						
Iron—Bar, Welsh, in London...ton	4	7	6	4	15	0
,, ,, in Wales	4	2	6	4	7	6
,, Staffordshire, London	5	10	0	6	0	0
Sheets, single, in London	6	15	0	8	10	0
Hoops ,, ...	6	0	0	7	0	0
Nail-rods ,, ...	5	15	0	6	10	0
Copper—British, cake and ingot ....ton	42	10	0	43	0	0
Best selected	44	0	0	44	10	0
Sheets, strong....	50	0	0	0	0	0
Chili, bars	39	5	0	39	7	6
Yellow Metal ....lb.	0	0	0	0	0	0
Lead—Pig, Spanish....ton	12	2	6	0	0	0
English, common brands....	12	7	6	12	10	0
Sheet, English	13	7	6	13	12	6
Spelter—Silesian, special ....ton	14	7	6	14	10	0
Ordinary brands....	14	5	0	14	7	6
Tin—Straits....ton	103	17	6	114	0	0
Australian	114	0	0	114	10	0
English ingots	107	0	0	0	0	0
Zinc—English sheet ....ton	0	0	0	0	0	0
OILS.						
Linseed ....ton	21	10	0	21	15	0
Cocoanut, Cochin	31	0	0	33	0	0
Ceylon	23	10	0	0	0	0
Palm, Lagos	21	0	0	21	10	0
Rapeseed, English pale	23	5	0	23	10	0
,, brown	22	0	0	0	0	0
Cottonseed, refined	19	10	0	20	10	0
Tallow and Oleine....	25	0	0	45	0	0
Lubricating, U.S.	5	0	0	6	0	0
,, refined....	5	0	0	12	0	0
Turpentine—American, in casks ....cwt.	1	9	6	1	9	9
Tar—Stockholm ....barrel	0	14	0	0	14	6
Archangel	0	11	6	0	12	0

CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Paving Bricks, &c.	Worthing Local Board	*Official*	June 6th	ii.
Making-up and Paving Roads	Wandsworth Bd. of Wks	do.	June 7th	ii.
Broken Guernsey Granite	Croydon Cor....	T. Walker	do.	ii.
Painting and other Works	Met. Asylums Board	*Official*	June 8th	ii.
Road-making and Paving Works	Hammersmith Vestry...	do.	do.	ii.
Jobbing Sewers Work	Mile End Vestry	J. M. Knight....	do.	ii.
Engine and Boiler-House, &c.	Croydon Cor....	T. Walker	June 9th	ii.
Erection of Bridge	Bridgnorth Highway Bd	*Official*	June 10th	ii.
Reservoir	Clevedon Waterworks C.	do.	do.	ii.
School for Boys	Governors, Williams's Schools, Caerleon ...	E. A. Lansdowne....	do.	ii.
Wood-Paving and Patent Glazing	Huddersfield Cor.	R. T. Dugdale	June 11th	ii.
New Vestry, and sundry Alterations	St. John's, Presbyterian Church Managers ..	*Official*	June 13th	xii.
Road Flints	West Ham Council.....	Lewis Angell....	June 14th	xii.
Broken Guernsey Granite	do.	do.	do.	xii.
Repairing Chimney Shaft	do.	do.	do.	xii.
Tar Paving Works....	Finchley School Board	*Official*	June 15th	xii.
Outfall Sewer	Burnham Local Board	J. H. Palmer	do.	ii.
Boundary Walls to Burial Ground	Chiswick Local Board...	A. Ramsden	do.	xii.
Stoneware Pipe Sewer	Reigate U. S. A.	*Official*	June 20th	xii.
Making-up Road, Stoneware Pipe Sewers, &c.	Tottenham Local Board	— De Pape	June 22nd	xii.
Sewering, Levelling, &c., to Road	Hanwell Local Board...	*Official*	June 28th	xii.
Sewerage Works	Kingston R. S. A.....	B. Latham	July 6th	xii.
Public Building	The Proprietors	T. E. Knightley....	Not stated...	xii.
Painting, Whitewashing, &c.	War Department.....	*Official*	do.	ii.
Painting, Paperhanging, &c., Lincoln....	do.	do.	do.	ii.
Toboggan Slide, Battersea	.....	J. R. Blacka.....	do.	i.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Master	Cambridge School of Art	150*l*.	Not stated...	xvi.

TENDERS

BETHNAL GREEN.—For the erection of a concert-hall, &c., at Bethnal Green. Mr. W. Batten, architect, 100, Bonnor-road, E.:—

E. Porter	£1,027 0 0
H. R. Okenden	1,018 0 0
W. T. Reynolds....	908 0 0
W. Marriage	970 0 0
J. Bartram....	966 0 0
Rider Hunt	964 0 0
S. Salt	927 0 0
S. Sabey & Sons	918 0 0
G. & J. Green	915 0 0
R. Edwards, jun.	888 0 0
W. & F. Croaker	867 0 0
F. T. Chinchen, Harrow-road, Kensal Green (accepted)	850 0 0

ELTHAM.—For the erection of additional stabling at Messrs. Carter, Paterson, & Co.'s Depot, under the superintendence of Mr. William Eve, architect and surveyor, No. 10, Union-court, Old Broad-street, E.C.:—

Harris & Wardrop	£982 0 0
C. Cox....	962 0 0
W. Downs	913 0 0
Godfrey & Son	905 0 0
S. Page	890 0 0
F. & H. F. Higgs, Station Works, Loughborough Junction (accepted)	880 0 0

ENFIELD.—For the making up, metalling, and paving the road and footpaths on the Glebe Avenue Estate, for the Enfield Local Board. Mr. Wm. Kitteringham, engineer:—

G. Martin, Leyton	£1,070 0 0
Bloomfield, Tottenham	1,030 10 0
Bell, Tottenham	1,010 0 0
Jackson, Enfield (accepted)	987 10 0

[Engineer's estimate, £987.]

ESHER (Surrey).—For proposed alterations and additions at Brookleigh, Hare lane, Esher, Surrey, for Mr. J. P. Robinson. Mr. R. T. Elsam, architect, Hampton Wick, Middlesex. Quantities by the architect:—

W. & H. Castle,* Red Cross street ...	£4,073 0 0
P. Peters, Horsham	3,970 0 0
R. Pink, Milford	3,889 10 0
W. H. Batchelar, Leatherhead	3,789 0 0
Martin Wells & Co., Aldershot	3,787 0 0
J. F. Collinson, Teddington	3,758 0 0
H. Simmonds, Reading	3,560 0 0
T. Wheeler, Kingston-on-Thames ...	3,493 0 0
R. Wood, Cobham	3,485 0 0
J. H. Jarvis, East Molesey	3,483 0 0
C. F. Kearley, Uxbridge	3,447 0 0
C. Boneil, Teddington	3,410 0 0
J. & J. Greenwood, Bermondsey ...	3,407 0 0
Kirk Bros., Battersea....	3,400 0 0
T. Hiscock, Hounslow	3,395 0 0
W. Hickinbotham, Teddington	3,360 0 0
J. Bottrill, Reading....	3,248 0 0
J. Piller, Teddington (accepted).....	3,240 0 0
T. H. Kingerlee, Oxford....	3,187 0 0
R Rowse, Manchester-square	3,130 0 0
W. J. Beale, Battersea	2,820 0 0

* We are informed that Messrs. Castle have since written stating that their estimating clerk had made an error in the casting of the summary, and their tender should have been 3,146*l*.

HAMPSTEAD.—For stables at West Hampstead, for Mr. H. G. Randall. Mr. Banister Fletcher, architect:—

Dowsing & Sons	£910 0 0
Mansbridge	829 0 0
Aitheson....	800 0 0
Dainton	784 0 0
Skele Bros.	775 0 0
Wm. Tout	745 0 0
Neave & Neave....	718 0 0
J. O. Richardson	689 0 0
Bursill (accepted)	675 0 0

HEREFORD.—For the erection of Jubilee Almshouses for the Ancient Order of Foresters, Hereford. Mr. W. W. Robinson, architect, 10, King-street, Hereford :—

H. Welsh	£1,090 0 0
E. Jones	1,077 0 0
W. Bowers & Co.	945 0 0
T. Lewis	930 0 0
J. Davies	880 0 0
G. Williams	843 0 0
W. B. Partington,* Eign-street	833 0 0
R. Taylor	795 0 0
C. Lawrence	765 0 0

* Accepted.

[All of Hereford.]

HEREFORD.—For the erection of a villa residence for Mr. T. Maund. Mr. W. W. Robinson, architect, 10, King-street, Hereford :—

Wm. Cullis, Hereford (accepted) £850 0 0

HOLLOWAY.—For alterations and additions to St. John's Tavern, Junction-road, Upper Holloway, N., for Mr. Ascott. Mr. H. I. Newton, architect, 17, Queen Anne's Gate :—

Godden	£1,435 0 0
Mark	1,420 0 0
Lamble	1,419 0 0
Burman & Sons	1,215 0 0
Jackson & Todd (accepted)	1,179 0 0

KEW.—For proposed gymnasium at the Star and Garter Hotel, Kew Bridge, for Messrs. Fuller, Smith, & Turner :—

Ashford & Co.	£869 0 0
S. Hunt, Chiswick	855 0 0
T. Nye, Ealing	723 0 0

LONDON.—For pulling down and rebuilding the Chapter Coffee House, Paternoster-row. Messrs. Taylor & Locke, architects. Quantities by Mr. W. Birdseye :—

Snow & Co.	£8,447 0 0
Hall, Beddall, & Co.	7,740 0 0
Clarke & Bracey	7,658 0 0
Conisell Bros.	7,610 0 0
H. & E. Lee	7,583 0 0
Perry & Co.	7,418 0 0
Boyce	7,350 0 0
Killby & Gayford	7,220 0 0
J. & J. Greenwood	7,171 0 0

LONDON.—For alterations and additions to No. 58, Wellington-road, St. John's Wood. Mr. Henry J. Treadwell, F.S.I., surveyor :—

W. Whiteley	£770 0 0
Styles & Son	635 0 0
J. K. Tinson	634 0 0

LONDON.—For alterations to Nos. 3 and 4, Whitecross-place. Mr. Banister Fletcher, architect :—

J. Garrud	£284 0 0
Kiddle & Sons (accepted)	281 5 0

LONDON.—For new entrance and staircases to Throne Room, forming small private dining-room, alterations to lavatories, &c., at Crosby Hall, Bishopsgate, for Messrs. Gordon & Co. :—

G. S. Archer, Featherstone-street, City-road (accepted) £226 0 0

[No competition.]

LONDON.—For new stabling and alterations at 164, Drummond-street, Hampstead-road, for Mr. Thomas A. Saunders. Messrs. Nevinson & Newton, architects :—

Patman & Fotheringham	£628 0 0
Vernall & Griffiths	623 0 0
G. & J. Green (accepted)	559 0 0

MAIDSTONE.—For alterations to the Firs, Maidstone, for Captain Stacey. Mr. Arthur R. G. Fenning, architect, 10, Lincoln's Inn-fields :—

Thos. Barden	£406 0 0
Wallis & Clements	394 0 0
A. Pryor & Co.	393 0 0
Cox Bros. (accepted, subject to modifications)	388 0 0

[All of Maidstone.]

MANSFIELD (Notts).—For making and forming Welbeck and Newcastle streets, Mansfield. Mr. R. Frank Vallance, Town Surveyor :—

Fisher Bros., Mansfield	£373 0 0
W. A. Vallance, Mansfield	320 7 0
J. Greenwood, Mansfield	309 10 0
S. & G. Frisby, Mansfield	306 0 0
James Bradley, Lincoln (accepted)	282 12 10

PAIGNTON (Devonshire).—For the erection of two shops on the Gerston Estate, for Mr. F. Palk. Mr. Stephen Woodbridge, jun., architect, 210, High-street, Brentford :—

Messrs. C. & R. E. Drew, 1,350*l.*

[No competition.]

SOUTHWARK.—For new bishop's residence and partial rebuilding of existing clergy house adjoining St. George's Cathedral, Westminster Bridge-road, for the Right Rev. Dr. Butt, R.C. Bishop of Southwark. Mr. Fred. A. Walters, F.S.A., architect. Quantities by Mr. W. H. Brayshaw :—

		Less for Ancaster Stone.
Dove	£15,255	—
Goddard	14,698	267
Lansdown	13,640	240
Brown	13,625	120
Parmenter	13,560	315
Conder	13,384	289
Boyce	12,840	200
Macey	12,638	213
J. Smith & Sons, Norwood Junction	12,387*	150*

* Accepted with modifications.

STOKE NEWINGTON.—For the erection of St. Michael's Vicarage. Messrs. J. E. K. and J. P. Cutts, architects :—

James Holloway (accepted) £1,749 0 0

[No competition.]

SUTTON MADDOCK (Shropshire).—For taking down and rebuilding Sutton Maddock Church. Messrs. Nicholson & Sons, architects, Hereford :—

J. Inwood* (Worcester and Malvern) £1,840 0 0

* Accepted.

[Twelve other tenders submitted, ranging from 3,397*l.* (highest) to 1,895*l.* (lowest). Names of senders of these not forwarded to us.]

TURNFORD (Herts).—For the erection of dwelling-house for Mr. Rochford :—

Bentley, Waltham	£1,384 0 0
Boswell, Enfield	1,310 0 0
Saunders, Cheshunt	1,247 0 0
Brown, Hoddesdon	1,245 0 0
Hampton, Hoddesdon	1,227 0 0
Pavey, Winchmore Hill	1,158 0 0
Farley & Maycock,* Waltham Cross	1,095 0 0

* Accepted.

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